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Table of Contents.

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Page.

ORIGINAL ARTICLES—
The Sir Richard Stawell Oration—The Principle of Health, by C. I. McLaren, M.D. 689
Some Observations on the Use of "Pentothal Sodium" under War Conditions, by S. V. Marshall, M.B., Ch.M., D.A., M.R.A.C.P. 694
Examination of Recruits for the Army, by R. J. Taylor 700
Examination of Recruits for the Army, by F. H. McClements Callow 702

REPORTS OF CASES—
An Unusual Acute Condition of the Abdomen, by P. W. Gill 703

REVIEWS—
A Year Book on Public Health 704

LEADING ARTICLES—
Social Security 705

Page.

CURRENT COMMENT—
The Treatment of Empyema Thoracis 706

ABSTRACTS FROM MEDICAL LITERATURE—
Dermatology 708
Urology 708
Medicine 709

PUBLIC HEALTH—
An Outline of a Possible Scheme for a Salaried Medical Service 710

BRITISH MEDICAL ASSOCIATION NEWS—
Scientific 725

NOMINATIONS AND ELECTIONS 728

BOOKS RECEIVED 728

DIARY FOR THE MONTH 728

MEDICAL APPOINTMENTS: IMPORTANT NOTICE .. 728

EDITORIAL NOTICES 728

The Sir Richard Stawell Oration.[1]

THE PRINCIPLE OF HEALTH.

By C. I. McLAREN, M.D.,
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DEEP in the ethical code of the Orient is a conviction concerning the lifelong debt of the disciple to his master; but that conviction knows no confines of East or West, as is demonstrated by this pious foundation—the provision of one of Stawell's students (Dr. A. E. Rowden White) for this annual Sir Richard Stawell Oration. That there should have come to me, another of Stawell's students, the great honour and privilege of delivering the 1941 oration is grace and favour which I account great indeed.

The year I began, as a third-year student, my attendance at the out-patient medical clinics of the Melbourne Hospital was also the year when Stawell became an out-patient honorary physician and clinical teacher at that hospital. It was my great good fortune to be a member of his first class. I hasten to add that the good fortune was tempered for me with an alarming concomitant, for Stawell did not "suffer fools gladly", and I have to admit that my initial incursions into clinical medicine showed the particular ineptitudes of a natural fool. I reaped the consequences. The years have passed and brought many boons—among them few more prized than this (I must boast of it with humble pride), that the man who was for me at first only an awesome Olympian, took me finally for his friend. I can never forget what it meant to me, returning on one occasion to Korea, to receive from Stawell a letter which he concluded by signing himself "yours affectionately". It was characteristic of the man, that warmth of human affection, an affection for which disparity in age was no barrier.

The years will come—nor can they be now long delayed—when those called on to deliver this oration will not be able to bring to their aid personal recollections about the subject of the oration. The more reason that we who can should follow Horace's advice, "*carpe diem*", and do what in us lies to enshrine recollections of one who was a great teacher, "a very parfit gentle knight" and a good man.

One does not even forget his dress. It set standards of nicety, propriety and modest distinction. His carriage and bearing bespoke a frame well knit by the athletic achievements of earlier years and the continued discipline of an active and temperate life. His remarkable head might well claim the attention of the phrenologists.

How sensitive and expressive were his hands, stretched out to drive home some point, or almost to grasp some elusive idea! How deft his fingers to trace diagrams of nerve tracts, and how delicate to bring out the dulness or resonance of the percussion note! But most of all one remembers the changing play of his expression—its keen intelligence, its impatience at the stupid and the unworthy; the bantering kindly humour and then the abandon of his explosive laughter; the sweetness, too, of his smile, and his tenderness and kindness to those who were little or weak or in trouble.

His words ring on in our memory—clinical aphorisms, arresting judgements, words of abiding wisdom.

"The symptoms, and especially the combination of the symptoms, determine the location of the lesion."

"The mode of onset reveals the nature of the lesion." (How I have laboured to translate just those words into the Korean language, so that Korean students too might share their diagnostic values!)

[1] Delivered at a meeting of the Victorian Branch of the British Medical Association on October 29, 1941.

"I know, I know, it's frightfully difficult; but we must work it out together." (And so he made the youngest student colleague with himself in the elucidation of the problems of medicine.)

"It's better to be wrong in a right sort of way than right in a wrong sort of way." (And so no short cut to achievement by mere parasitic knowledge.)

Then, quoting Christina Rossetti: "Does the road wind up-hill all the way? Yes, to the very end." (And his life of strenuous endeavour actually was, as he would have had it be, uphill to the very end.)

And how can there ever be forgotten that *bon mot* of his at the time of his engagement: "Ferguson, how long does this state of exaltation last?" (Thank God, for men like Stawell it can and does last.)

The title of this lecture has been suggested by another of his sayings which all through my medical life I have cherished: "We must seek to get some sort of a broad philosophical view of the case."

In the essential fitness of numbers, seven has been accepted as the perfect number. Seven marks, to my mind, characterize a good physician.

1. He must be *en rapport* with Nature. Stawell used to remind us of the significant etymology of the word "physician"—the man who was versed in φύσις, physic, Nature. Stawell showed himself always the humble student of Nature. There was nothing arbitrary in his way. He drank direct from the springs of Nature. He had some gift to discern the realities of a case. As a great scientist, Rutherford, has said: "What is needed in science is not some seemingly clever theory, but the knack to see how God has made things." So Stawell, as he approached a case.

2. He must work. By exhortation and especially by example, Stawell called us to work. On his lips were those great words of Osler: "The master word in medicine is, work."

3. He must have truth and courage compacted in his life. The truth that gives courage, the courage that finds and speaks the truth—something akin to what Osler described as "*æquinimitas*". Stawell scouted pretentions and scorned humbug. He found the truth and spoke it. He lived near to reality.

4. He must have compassion. How often one has seen Stawell, apparently entirely immersed in the scientific implications of the case he was demonstrating; then, in a moment, all changed, and his sympathy for the human sufferer before him transformed the whole scene.

5. He must show keenness in diagnosis—in differential diagnosis. To my mind there is one paramount fact in differential diagnosis which has to be recognized—the fact that some diseases are essentially of and from the body and that there are others which, while they may be of the body, are from the soul. Stawell was a master in discrimination of physical manifestations. He was something more. His maturest years found him most of all devoted to matters of psychological import in medicine and hygiene. He was the first president of the Victorian Council for Mental Hygiene.

6. The physician must have that mysterious thing, the healing touch. This is neither occultism nor superstition. Happily it proves itself fact. Osler had it, so that wards filled with erstwhile "chronics" emptied themselves under the magic of his presence. Patients went to see Stawell and something went forth from him to their recovery.

7. I think the physician must be a philosopher. In saying this I have the temerity to differ from the greatest of all philosophers, Plato, who says that philosophers are not to be trusted with the practical; but then Plato did not know Stawell! And Stawell enjoined upon us to take a broad philosophical view.

The title of this oration is a philosophical title, "The Principle of Health"; but before I develop that special theme, there are two other matters I desire to lay before you. First, in a lecture which is a tribute from a disciple to his teacher, it is fitting that the lecturer should lay before the medical profession such special proof as his own experience (guided by the training he had received) has garnered in the rich fields of medical practice. As Browning puts it:

> Karshish, the picker-up of learning's crumbs,
> The not-incurious in God's handiwork
> (This man's flesh he hath admirably made,
> Blown like a bubble, kneaded like a paste,
> To coop up and keep down on earth a space
> That puff of vapour from his mouth, man's soul).

Secondly, in accordance with the direct request of the founder of the oration, I propose to bring to you some short survey of medical conditions and prospects in the Far East at the present time. Finally, I propose briefly to lay before you the conclusions which years of reflection on the principle of health have brought me.

Four Crumbs of Learning.

1. My professional life has been lived, these thirty years, as a Christian missionary in an oriental land. It is a branch of our profession of which I hold that we may all be justly proud. Medical missionaries are pioneers, even as was that Cortes who boasted to the Spanish king that he had added more territory to the Spanish Crown than the king's ancestors had known provinces. During the last 100 years what the pioneering efforts of perhaps 1,000 men and women in various mission fields have added to medical knowledge, and the benefits they have conferred, need to be seen to be believed. Take one example only. A little group of men set themselves to the task—it looked about as practicable as emptying the ocean with a teaspoon—of providing medical education for China. As an Australian I am proud to think that an Australian, E. J. Stuckey, was a party to that quixotic adventure. And the upshot? This: the Rockefeller Foundation recognized the magnificence of the conception and followed in its train, and today there is functioning in Peking a truly remarkable institution of healing, of teaching and of medical research, the Peking Union Medical College.

David Livingstone, explorer and liberator; German Schweitzer, doctor of music, doctor of theology, doctor of philosophy, and doctor of medicine, labouring deep in tropical Africa and contradicting by his every attitude the Nazi way of life; Dugald Christie, founder of the Scottish-Danish-Manchurian medical college in Mukden; our own South Australian, E. J. Stuckey, O.B.E., architect and builder (both in its physical structure and its professional workings) of the remarkable Mackenzie Memorial Hospital in Tientsin; these men are exemplars of what our profession has contributed to the new world of health and enlightenment which is to be, which has been in process of taking shape before our eyes.

My own experience has taught me, I hope, many lessons; many observations have inevitably been forced upon me; were there time, I could enumerate many striking resemblances and arresting differences in the incidence of disease when comparing Australia and Korea. This generalization I allow myself: any people, it has been said, gets the sort of government it deserves. With perhaps greater truth it might be said that it is visited by the sort of diseases it prepares itself for. Nor must we think of disease as a mere individual incidence. If we admit the universal fact of the morbidity of this body of our humiliation, the nature of the disease that occurs is largely determined by the habits of the community as a whole. By and large, Australians do not suffer from leprosy, dysentery, cholera, typhus fever, typhoid fever, scabies, because they decide not to; they still suffer from syphilis, gonorrhœa, tuberculosis, arteriosclerosis and the immediate and later effects of alcoholism, because they do not determine (and pay the cost of determining) to be free of these scourges.

By and large, Koreans do not suffer much from arteriosclerosis (perhaps because of their poor meat diet), varicose veins (perhaps because of their sensible dress and their wisdom in sitting on the floor, so avoiding dependent legs with a right angle bend at the knee). They have little rheumatism, arthritis or gout (again probably owing to their diet). They were exempt from beriberi till machine-hulled white rice was introduced. Their freedom (till

recently) from tabes and general paralysis of the insane is, I think, probably to be ascribed to a strain of spirochæte less virulent than has prevailed in the west.

2. The second crumb I offer is the outcome of the fact that my professional work has concerned itself especially with the neuroses, the psychoneuroses and the psychoses. In my student days I caught from Stawell an enthusiasm for neurology; the bent of my own mind carried me on to immersion in the problems of psychological medicine. This crumb that I offer from my experience I designate as the "spill-over" and the "compartmental".

I have come to recognize two types of people. One type I have characterized as the "spill-over" type, the other as the "compartmental" type. There are some individuals whose emotions are immediately "written" upon their viscera. In an emotional situation they flush, their hearts race, the stomach refuses to digest, diarrhœa occurs, even (in the case of pregnancy) the uterus may empty itself in a miscarriage. There is another type of person; his emotions are not less, but there is a minimal "spill-over" from the consciousness into the viscera. These are the "compartmental" people. Their feelings remain in their consciousness. Incidentally there is no occasion, I believe, to exalt or disparage one or other of these types as against its contrary type. I throw it out, however, as a fit subject for careful medical research, to determine whether perhaps the "spill-over" from the mind into the viscera is not a relief mechanism, and whether persons of this type are perhaps more liable to become ill in body but less likely to be the victims of a psychosis. Further, I am inclined to the belief that, while there are people of either type in every race, certain types predominate more in certain races. Experience, too limited to allow of confident generalization, suggests to me that in the Hebrew race there are many "spill-overs" and in the Chinese few, while the Anglo-Saxon race perhaps shows a more even distribution of the two types.

I have been accustomed to say to my students that neurasthenia is the easiest of all diseases to diagnose. The diagnosis is made for one by the patient himself as he is settling down into the consultation-room chair. He gives you the diagnosis and he is always right: "I am suffering from neurasthenia." (On the lips of all my Korean patients is the word which is an exact and full Sino-Korean translation of our Greek-derived word "neurasthenia.") But what is neurasthenia? In fact, it is an effect, not a cause. It is caused by conflict—unsolved conflict in the psyche—and that conflict spills over from the psyche into the autonomic system and the viscera.

Modern informed thought is singularly unanimous in giving this interpretation of the neuroses and the psychoneuroses. True, there is sharp difference of emphasis about the nature and content of the conflict; but men with such widely differing outlooks as Déjerine, Freud, Adler, Jung and Pavlov unite in teaching that conflict is the origin of the disease.

Here I wish to make a distinction which has been too little recognized. What is the distinction to be drawn between the neurasthenic and the hypochondriac? The answer is that the hypochondriac is a special sort of neurasthenic. All neurasthenics are by no means hypochondriacs. Not only among the laity, but even within the medical profession there is much loose thinking on this point, and loose thinking here is also unkind and uncharitable thinking. There is a point of view which dismisses the neurasthenic with the judgement: "He is ill because he thinks he is ill." Now he certainly is ill, and with a real disease. It is a disease which often may go on to some gross organic lesion; a gastric ulcer is as much an ulcer whether its original cause is hyperchlorhydriac indigestion brought on by worry, or by the swallowing of a caustic drug. The point is that neurasthenia is a disease brought on by conflict in the soul, and the further important point is that that conflict may have nothing at all to do with apprehension about the body or, conversely, it may have everything to do with health fears.

Thirty years ago Déjerine offered the following statistical survey of the types of preoccupation (conflicts) which in his experience led to neurasthenic breakdown: conflict due to (*a*) monetary affairs, 13%; (*b*) moral scruples, 14%; (*c*) sex, 22%; (*d*) the affections, 24%; (*e*) bodily health, 27%.

The important distinction between the general neurasthenic and the hypochondriac was first convincingly brought home to me by a case, brief notes of which I give.

A patient came to me with the symptom-complex, physical and psychical, diagnostic of neurasthenia. The interoceptor system was in a condition of dysfunction and the patient was "nervous" and looked strained and profoundly anxious. Examination revealed also an acute and progressive tuberculosis. The tuberculosis, of course, accounted physically for much of his bodily symptomatology, but that is not my present point. The man was obviously so strained and anxious that I hesitated to add to his burdens by revealing to him the urgency of the threat which his tuberculous disease carried. As gently as possible I told him of the condition which examination had revealed. His reaction I shall never forget. He brushed aside as almost a triviality the physically desperate tuberculous condition. "After all", he said, "tuberculosis can only kill me, and that would end my troubles; but the frustration of my desire makes life unbearable. I am denied the opportunity of study, and what is man better than the beasts that perish if his mind is unfurnished." The patient was a Korean.

Incidentally his reaction throws an interesting and laudable light on Korean values. (I have the impression that the disturbance in the autonomic system was due to anxiety as well as to the tuberculous toxin.) Physical neurasthenic he may have been; but how remote his mentality from the hypochondriac, all whose fears and preoccupations concern his bodily state!

I would make the further differentiation about the hypochondriac that he may be either of the psychotic or the somatic type, according in the individual instance as to whether the patient happens to be of the "compartmental" or "spill-over" make-up. In either case his original trouble is fear and apprehension about his body, his health, his life. If he be "compartmental", the agitation of his psyche remains in the psyche and finally he may become actually psychotic, but there are no bodily symptoms. If he be of the "spill-over" type, the agitation of the psyche spills over into the interoceptor system and he has bodily symptoms. These, of course, immediately become a cause of new alarm. A vicious circle is set up, and unless something can be done to break that circle, to cure the symptoms and to remove the cause, the patient is indeed in a sorry plight.

The recognition of this fact of conflicts of all sorts, and especially of apprehension about bodily security, as a true cause of many diseases is at the basis of (and is the measure of truth in) Christian Science. It is also at the basis of the indubitably good results obtained by Christian Science, by Couéism, and many other more or less scientific methods of psychotherapy. But as a scientific or philosophical system Christian Science has—what is more than a limitation—a cardinal error. G. K. Chesterton has well said that "Truth is in Paradox". And Christian Science, as well as a great deal of medical thinking, has failed to recognize a converse, paradoxical factor opposite to the fact that apprehension is a cause of disease. Emphatically it is not the case that all who are ill are ill "because they think they are ill". Of course, common sense allows that a man who has lost several limbs, blown off by a bomb, is ill for some stronger reason than that suddenly he "thought himself ill". That is not the type of situation to which I am inviting your attention. It is this more subtle one—the situation of the man who has no apprehension, who thinks himself well, and is not. Like Samson with his locks shorn off "who awoke out of his sleep and said, 'I will go out as at other times and shake myself'; but he wist not . . ."; so the man who is without apprehension thinks himself well, but "something has gone from him". The wise physician will seek to instil into the mind of such a patient, not indeed apprehension, but a just sense of those limitations which perhaps all unawares and insidiously have come upon an erstwhile healthy frame. (*Vide* "The Structure of the Personality", *The British Medical Journal*, September 11, 1937.)

3. My next crumb is a brief critique of the Freudian system. Freud is a giant who has lifted a beacon and

thrown a shadow over the medical thought—indeed over the general thought—of our generation. He delivered medicine from the bondage of the strictly materialistic determinism in which it was held thirty years ago. He taught the actual psychogenic origins of certain disease. For this medicine owes him a great debt. But in my opinion he delivered it from one bondage into the hands of another—a pessimistic psychic determinism which knows neither real freedom nor rational hope.

To my mind Freud presents (in his unconscious mind) the unedifying spectacle of a man like Jonah—a man who is a Jew, and perhaps meant to be a prophet, running away from God. And of all men the Jew least successfully departs from the divine illumination. Freud lost God, and instead, and as the ultimate explanation in his philosophy of life, he found a phallus.

There are three central dogmas in Freud's teaching about sex and its relation to disease: (*a*) that sex is essentially insatiate and insatiable and therefore incapable of a discipline which is without pathological strain; (*b*) that sex is unclean; (*c*) that sex is frightsome, menacing, a threat. Take the last of these three dogmas. In its turn it lies at the root of the theory which says that the sex urge is compacted of such dark spectres that they must be and are thrust down into the unconscious. When I was in Vienna I listened long to explanations of the phallic origins of fear dreams. The reason, so I was told, why a snake appears in terror dreams is from its resemblance to the male sexual organ. There are many frogs in Korea; they jump away in alarm into the neighbouring rice fields when they are approached. I once encountered a frog which did not jump. The reason, on investigation, proved to be that it was paralysed with fear by a snake which had marked it for its prey. But a frog has not yet arrived at that stage of biological development in which there is an external male sex organ. This is sufficient proof, I think, that all that frog's fears, and most others, are not of distorted sex origins!

Freud's second dogma is that sex is unclean. Every naughty little boy thinks so, and children of an older and uglier growth continue to think so too. In the ghettos of eastern Europe nasty ideas would no doubt find fertile soil, and for this the gentile who decreed the ghetto is, I suppose, more to blame than the Jews who suffered in it. But this assumption that sex is dirty is true only as men furtively make it true; nor, I hasten to add, is it a Jewish idea. The conceptions which a Jewish law-giver brought down from the flaming heights of Sinai are purified of any such taint; still less does the idea match with those thoughts of divine and holy love which flowered on the blessed hills of Galilee.

Again, Freud holds to a dogma that sex is insatiate and insatiable. If he had taken not a pathological, but a biological, view of sex, might he not have seen that it is like any other appetite, both capable of normal satisfaction and recurring in the course of Nature? This does not prove that it cannot be suitably disciplined. True, discipline is not easy. It never is. Saint Paul puts self-control as the final one of his ninefold category of the fruits of the spirit.

But most of all, in the popular as in the professional mind, the Freudian explanation associates itself with the unconscious. That there are forgotten memories, and that these subliminal factors are part and parcel of the total personality, who would deny? But the unconscious as an explanation, and psychoanalysis as a method of treatment, suggest to my mind those marvellous contraptions of Heath Robinson (I hope the younger generation has not been deprived of their exquisite humour), in which immense ingenuity is displayed in the depicting of machines which do all the things machines are meant not to do—immensely increase the difficulty and tedium of the operaton to be performed, and do so with the very greatest possible "mechanical disadvantage". So explanations of the obvious in terms of the recondite and supposititious!

Is not the important matter in the treatment (for instance) of the man who has gone to pieces with fear, not the mere uncovering to such a man of the forgotten (even the submerged) memories of his childhood's fear (and it is very much the case where a fearful disposition is concerned that the child is father of the man), but that by some alchemy of the spirit a person should be brought to the frame of mind which, for once, refuses to bury its ghost and faces and fights the worst of its spectres? There is one sure release from the bondage of fear. It is in the knowledge of the truth, the truth which makes men free. It makes weak men strong.

4. The last crumb of my picking which I offer is this: the conception, as it were, of a "fourth dimension" in the causation of disease. Man is not merely a thing moving only by the laws of physics. He is not merely an animal determined by physiology. He is not merely even only a moral being choosing good and evil. He is also a spiritual being. My own heart and what I have seen in many lands convince me of this fact. This dimension is something different from all that we share with the animals. A dog may sorrow and finally even die, from the soul trauma which comes to the canine loyalty at his master's death; but a dog knows nothing and can know nothing of the revolt of the human spirit against "the truth which is word of God"; neither can it know faith in the divine promises. That man is purblind who cannot see that humanity is endlessly and universally exercising itself for better or for worse in this fourth dimension; of this it may well be said "*quod semper, quod ubique, quod ab omnibus*". Among the very strongest of human emotions is man's sense of sin. So Shakespeare paints Lady Macbeth: "Out, damnéd spot! All the perfumes of Arabia will not sweeten this little hand."

I doubt if there is any activity at all to which humanity has directed more of its mental energy than the attempt, whether by rationalization, or by expiation, or by "good works", or by asceticism, or in a thousand ways, to justify itself in its own sight and before God. If it be purblind to fail to recognize these facts, it is tragic diagnostic ineptitude on the part, especially, of the practitioner of psychological medicine to fail to recognize here a protean cause of nervous and mental disease. And as treatment must be matched with ætiology, he has not yet begun to be able to meet the deepest needs of these patients whose therapeutic repertoire is not stored with the things of the spirit.

Medicine in the Far East.

As the second main division of this oration, I turn now to a subject with which the founder of the oration asked that I should deal—some survey of the position of medicine in the Far East. The subject is so great as to deserve not a mere section among others in a single oration, but a treatise for itself. But there is advantage in brevity, and sometimes a conspectus may convey and lodge more grasp of a large and unfamiliar subject than a detailed analysis. I shall not attempt here to discuss how and why it came about that the oriental mind did not, of its own initiative, arrive at that place of experimental scientific inquiry and progressive control over Nature by the human intellect and will which characterizes the modern world. One thing I must say as protagonist of the oriental races; I can find no evidence at all of their mental inferiority to those of the west. In other reason than such inferiority, I am convinced, one must look for the cause of the divergent developments in east and west. This also needs to be said and emphasized: the attitude of the modern scientist in Japan, China or Korea (and the same applies no doubt to India, though I am less in a position to speak with first-hand knowledge of that country) is that in adopting science he envisages not the conforming of himself to a specifically western model, but as entering into a universal discipline and making himself heir of a treasure to which east and west may become possessors of equally valid title deeds.

Though I have lived in the east for thirty years, I must confess myself all too ignorant about ancient oriental medicine. Some things, however, are evident. There are a store of sound observation and a wealth of empirical experience. There has been familiarity with many useful drugs, among them opium, mercury, ginseng, ephedrine, bone marrow, carminatives. As yet unfamiliar with

scientific ætiology, old-time oriental medicine devoted much attention to facts of constitutional resistance, and wise practitioners are credited with unusual prognostic acumen.

There runs a strong philosophic strain through Chinese medicine. As Dr. E. H. Hume points out in "The Chinese Way of Medicine":

> Chinese medicine teaches that the phenomena that make up health and disease are related to the universe as a whole . . . Health and disease are due to the balance or unbalance of the living forces which make up the universe. It is the concern of medicine to neutralise the malevolent influences of the environment by the help of friendly spirits, to bring to man's aid every friendly force in nature, and to use, for the patient's restoration, medicaments that have not only what the West calls pharmacological value but that are also, in themselves, akin to the forces of life and vigour. Man is only a detail in the life of the universe . . . [the artist] is moved to profound metaphysical and religious contemplation as he seeks to express the affinity between man and nature. The Chinese has faced his foes whether human or in the forces of nature with adaptation and compromise rather than with analytical enquiry with a view to control and transformation . . . This is not defeatism and despair . . . danger, disease, disaster and death are believed to be as normal a part of the universe as health and happiness.

The cosmic forces of the Chinese philosophy are the eternal *Yin* and *Yang*: weakness, darkness, disease and death on the one hand, and on the other strength, light, health, life. There is no essential optimism in the Chinese philosophy that the *Yang* can ever and finally overcome the *Yin*.

In criticism of the actual development of the art of medicine in the ancient east, one has to admit that failing to which human nature has so often yielded—the improper exaltation of authority in places where the appeal to authority is altogether uncalled for. The converse fault has also, perhaps inevitably, prevailed—that when men were due to appeal to the authority of direct observation and experiment, they indulged themselves in the luxury of irrelevant speculation and dogmatic conclusion. This latter point of view was amusingly and instructively illustrated to me in a conversation I had with an old-time Korean doctor. He knew I was interested in neurasthenia; so was he. He explained to me the cause of the disease—"that the relative normal position of the renal vein and artery were reversed, what was normally above was underneath in the neurasthenic". I was surprised at this explanation, and from this source, as I had every reason to believe my friend had not seen the inside of a dissecting room. I asked him how he knew. His reply was immediate: "I thought about it and realized it was so!"

But medicine is on the march in the orient. The names of Noguchi, Shiga, Taka and Hata (who collaborated with Ehrlich in the synthesis of "Salvarsan") are known to universal medicine. The Japanese is a master in the manipulation of the minute and the delicate; rapport with nature is deep in the Japanese soul; he is very able and a hard worker. No wonder that enormous advances have already been made and that the future is bright with promise!

With equal confidence we may look to the future of scientific medicine in China. In broad, wide humanism the Chinese race, it seems to me, is unrivalled; and, as the four thousand years of its history prove, it keeps going. Renaissance has come to China. The Japanese have proclaimed "a new order in Asia". It had already begun; and not all the violence of militarists and war lords is going to hold back or stem the rising tide of scientific treatment, of medical education, of public health and of State medicine, which marks the modern era in China.

My own special experience has been in the little country of Korea. The short space of thirty years has wrought a complete transformation. I have reason to have personal appreciation of the practitioner who has evolved in Korea. I owe the life both of my wife and of my daughter to the well-timed intervention of Korean surgeons, and to the same skill I owe the clearing up of a mess of a ventral hernia bequeathed to me by Australian surgery of forty years ago.

I ventured on a story at the expense of old-time Korean mentality. I tell now another, which I think may be fairly said to represent something innate with the Korean—his ability to unite the material with the idea and the ideal. Those of you who are interested in the Olympic Games should know that the marathon race in the last games was won by a Korean. I asked young Mr. Son whether he won the race with his legs or with his spirit; his quick reply was: "With both."

The Korean is a practical realist, as is proved by the surgical successes I have related and as is proved also by the fact that the hospital that we Australians founded in Chinju is at the present moment being run by a young Korean, and, I am bound to admit, run in important particulars better than we foreigners ever succeeded in running it. But the Korean is something much more than a man who can handle the material. There is an important side of his nature which makes it easy for him to enter into the realm of the spirit. I can well believe that some of the ideas which I have expressed and shall express in this lecture may fall on some Australian ears quite unresponsive to their meaning. If so, it is consolation to me to know that quite a number of my Korean medical friends know at once what I am talking about, because, though I may express my ideas in poor Korean, yet I speak in a deeper language which they also speak.

The Principle of Health.

Finally, I address myself to the concluding section of this oration, to ask with you, what is the principle of health? We may find the answer to that question writ large in the life and character of the man whom we honour here tonight. In rapport with Nature; in a life of strenuous endeavour; in courage and sincerity; in sympathy and compassion; in discrimination of judgement and choice; in outgoings of helpfulness and in love of wisdom; in these things are the ways of health. But health is not only an individual affair. Health for the individual is bound up with the health of society. Here also Stawell pointed the way. He was a practising physician, but he had concerned himself to study and to win a diploma of public health.

Stawell was born in the same decade (if my memory serves me) in which was published Darwin's "Origin of Species". I have ventured on a generalization that a community gets the diseases it deserves. But that is only half the story. Environment, as such, is a large factor in producing disease. Survival depends on adaptation to environment, an adaptation which may take the form either of retreating from environment or of advancing upon it and overcoming it; for instance, poisons are to be eschewed, food assimilated.

The lower animals, in their native state, though consciously they have formulated no principle of health, have in large part actually achieved it. Adaptation which is to secure human health must secure the necessities of (*a*) food and drink, (*b*) covering and shelter, (*c*) air and sunlight, (*d*) cleanliness and freedom from noxious assault. In addition there must be appropriate alternation of exercise and rest and suitable response to the urge of sex. In all this there is nothing extraordinarily difficult for life, and, as has already been pointed out, the lower animals have unconsciously achieved the principle of health.

But modern man has left his natural environment. Civilization, industrial scientific civilization, has come, and whether we welcome it or deplore it, civilization is here to stay. For us men of this era and of this twentieth century the question we have to answer is: what for us now is the practical principle of health?

Civilization is often envisaged as an unnatural environment prejudicial to health and vitality. In point of fact, already civilization has proved itself thoroughly congenial to man's bodily health. Declining morbidity, falling death rate, increased longevity substantiate this claim. Heiser, in his book "A Doctor's Odyssey", actually raises the question whether the population of New Zealand is not being exposed to a later menace because the present conditions of life in New Zealand are so healthy that opportunities for developing immunities are too few! I think we need not allow that danger to alarm us unduly.

We are on the threshold of an immense advance in our control over Nature. In the realm of physics humanity has already achieved. What the men of our generation accomplished in the physical field is, I augur, to be matched in the realm of applied biology by the generation now preparing for that great acheivement. All this may well be true, but a new menace appears—a grim spectre rises in the path of humanity. Carrel, in his thoughtful and notable book "Man the Unknown", goes so far as to suggest that there is a danger of the complete breakdown of our civilization through the multitude of neuroses and psychoses which it is breeding. Nor has Carrel any really constructive remedy to offer by which the tide may be stemmed and the disaster averted.

The last time I was privileged to converse with Sir Richard Stawell our theme came close to just this problem. There weighed upon his sensitive soul the thought of patients whom he was seeking to help, men and women discouraged, defeated, adrift, compelled to essay and continue life's difficult journey, yet without compass in hand nor vision of the stars to guide. Sir Richard framed a question like this: "What are we to say to such folk? How are we to bring to sometimes shallow souls health-giving realization of the things of the spirit?" To that deep, earnest question of my teacher I want to essay an answer.

First of all, and emphatically, I want to declare that the man who uses psychic, or as I prefer to call it, spiritual remedy, in the cure of mental or physical disease, is in no wise absolved from the obligation of employing also all appropriate material remedies. Conversely, let not the man in whose hands is a physical or chemical remedy fail to bring also appropriate spiritual help. This latter obligation was brought home very strongly to my mind by Dr. Ramsay Webb's recent Beattie-Smith Lectures. Quoting von Meduna himself, Dr. Webb emphasized that the "Cardiazol" convulsive treatment for the psychoses is bound up with suitable psychotherapeutic help for the sufferer. "The significance of the psychiatric treatment seems to me to be so far beyond doubt that I consider it unnecessary to look for justification." These are von Meduna's own words.

As a great saint and a great scholar, the late Bishop Charles Gore, has well pointed out, the converse and antithesis of spirit is not materiality. The antithesis of a good spirit is an evil spirit. The converse of matter in order and controlled is matter at random and out of place.

My own conception of matter (and of course our bodies are material) has been moulded largely by the conclusion expressed by my brother, the late Professor Bruce McLaren, in his Adams Prize Essay—a conclusion shared by other philosophical physicists, such as Jeans or Eddington: "Matter is thought which has taken form." Such a conception lays a sound philosophical basis of understanding of the mutual interplay of matter and spirit. It gives abundant encouragement for the hope—a hope experience carries into belief and achievement—that there may be helpful interference, material and spiritual, where living matter has failed of health.

But before we can satisfactorily answer the question how to cure mental and nervous disease, are we not due to put first another question: "Why are these mental and nervous diseases so prevalent in human life?" A great modern psychologist, Jung, has attempted to answer the question. He says it is "due to modern man's failure to recognize the deeper meaning of life". I am prepared to accept this statement of ætiology; but to make the statement not only correct but complete, I would suggest this addition: "and in failure to bend his being to conform with life's final purpose and commanding obligation".

Modern psychology has made a brilliant and convincing analysis of the workings of the insane mind. More terrible and more inevitable than the Nemesis of a Greek tragedy, degradation and delusion are seen to destroy the hapless victim. Saint Paul summed up this modern psychological analysis of the insane mind when he wrote: "Since they refused to love the truth that would save them, therefore God visits them with an active delusion till they put faith in falsehood." (Moffatt's translation.) The world's madness has proved that what applies to individuals applies also to national psychology.

What then—and this the all-important question—is the truth that can save us? Emphatically it is not, as has been cynically said, "at the bottom of a deep well". The simple, practical, necessary truth for living is, I believe, as the sun shining in mid-heaven, which men may see if only they do not bury themselves in the deep tunnels of their own selfishness, pride and fear. Truth for living has come into human life. It has come in the progress of theoretical and applied science, in the abiding wisdom of the saints and sages, in the insight of the artists and poets, and, uniquely, in the person of Jesus Christ, great physician and teacher of our race.

Said Francis Bacon: "The enquiry of the truth, which is the love-making or wooing of it, the knowledge of truth which is the presence of it, and the belief of truth which is the enjoying of it, is the sovereign good of human nature." We may add, it is for us physicians the sovereign remedy against disease. This is the principle of health; this is "the tree whose leaves are for the healing of the nations".

SOME OBSERVATIONS ON THE USE OF "PENTOTHAL SODIUM" UNDER WAR CONDITIONS.

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THE production of general anæsthesia by means of drugs given intravenously was, before the development of the short-acting barbiturates, so subject to difficulties and hazards as to be virtually impracticable. During the past nine years, however, since the discovery of "Evipan Sodium", an increasing interest in this novel and efficient method of anæsthesia has been developing, especially in the United States of America and in England. The introduction of "Pentothal Sodium" about six years ago[1][2] marked a significant advance because of the many advantages of this drug in comparison with the other,[1][2][4][5] that is, "Evipan Sodium", and nowadays "Pentothal Sodium" has largely replaced "Evipan Sodium" (soluble hexobarbitone) in general favour. Doubts about the safety of the method, based on the irrevocability of the drugs after their injection, are virtually groundless, since their destruction is soon effected in the body and presumably by the liver. The excellence of "Pentothal Sodium" in particular is illustrated by figures from the Mayo Clinic, where it had been used 24,676 times during the period of six and a half years ending December 31, 1940.[6] Authoritative English opinion is also emphatic about its superiority.[7]

"Pentothal Sodium" was first employed in Australia about the middle of 1936. Since then the knowledge of its properties has spread widely, and notably among those holding appointments in the larger hospitals. As a result a large body of medical practitioners, comprising especially the more junior men, is now familiar with its use and potentialities. The drug gives almost universal satisfaction, provided certain limitations are recognized. Patients find it pleasant and devoid of after-effects. They will accept repeated administrations with the greatest calm and equanimity. Anæsthetists are impressed by its rapid and positive action, by the absence of delirium and struggling during the induction stage, and by the rarity of serious complications during and after its use. It produces adequate muscular relaxation, is suitable for a wide range of surgery, and it will provide anæsthesia of any required duration. Nurses and orderlies prefer it, because the preparation of the subject is simple and the amount of after-care demanded is negligible, since the patients are quiet, do not vomit and are generally amenable. For all concerned it saves much time and trouble, much annoyance

and discomfort, especially under conditions in which facilities and assistance may be limited.

The excellent results that "Pentothal Sodium" gave in civil practice indicated that it would be invaluable for military purposes. Long before the outbreak of war English medical journals were discussing these possibilities, and there seemed to be no doubt that "Pentothal Sodium" would be used extensively in war-time if adequate supplies were available. These expectations have been amply fulfilled in connexion with both military and civilian casualties. Ever since the middle of 1940, reports, letters *et cetera* have been appearing in the various medical journals published in Great Britain, emphasizing the value of "Pentothal Sodium" in dealing with both air-raid and battle casualties.[(1)(2)(10)] This has been found to apply especially in situations in which large numbers of subjects must be dealt with expeditiously and often with a minimum of assistance. Given some initial tuition (and sometimes perforce without it), persons who ordinarily would hesitate to employ the intravenous method of anæsthesia have become competent exponents of and complete enthusiasts for it. Indeed the method has become a commonplace affair, and in most British hospitals, civilian and military, it is employed extensively.

Our own army authorities wisely included "Pentothal Sodium" and the necessary facilities for its administration in the drug and equipment scales of the various medical units. Recent experiences have shown how beneficial this decision has been. There was perhaps an early tendency among us not to use "Pentothal Sodium" so freely as was the case in British circles, in which admittedly supplies were comparatively lavish. More recently, however, our use of the drug has increased considerably, with results that have been generally very satisfactory. A steadily growing volume of favourable reports about it is accumulating from sources in both forward and base areas. The 0·5 gramme style of ampoule, however, has been found rather inadequate under service conditions, and is now largely replaced by the 1·0 gramme size. In general, the larger is found necessary for soldiers, who are often of strong physique and active metabolic status. Nevertheless, it is convenient to have a few 0·5 gramme ampoules on hand for use in short operations or for occasions when a small supplementary quantity may be required to prolong the anæsthesia given by 1·0 gramme.

"Pentothal Sodium" fulfills many of the requirements of the ideal field service anæsthetic. It is potent and is suitable for a large proportion of the likely operations. Its toxicity is low and its action is rapid, efficient and pleasant. The after-effects are negligible. It is of small bulk, easily portable, non-inflammable and not subject to deterioration on storage. Although the administration involves the preparation of a sterile syringe and needles, nothing elaborate is required. The anæsthetist may need a little extra assistance at the outset of the administration; but this is more than compensated for by the reduced attention demanded of orderlies or nurses during the recovery period. Occasionally patients are restless and intractable at this latter stage because of disturbing suggestions conveyed to them during the induction of anæsthesia. These unusual reactions are easily controlled by the administration of morphine either hypodermically or, if necessary, intravenously.

It is considered to be no exaggeration to say that "Pentothal Sodium" stands with sulphapyridine and desiccated blood plasma as a recent landmark in medical progress, and that, as with them, a proper recognition of indications and limitations will lead to uniformly satisfactory results from its employment. This comparison may seem extravagant or even absurd; but the truth is that "Pentothal Sodium", through no intrinsic defect of its own, has been slow in achieving the recognition it deserves in Australian medical circles. Desiccated plasma suffered a similar early neglect, possibly because of the more spectacular features of the blood-bank schemes; but its advantages, and those of serum, are now, of course, generally recognized. It is of interest to note at this stage that the presumed incompatibility of "Pentothal Sodium", which contains sulphur, with sulphonamide derivatives, has been shown to be of no moment in practice. Indeed, both may be given concurrently by the intravenous route without ill effects.[(11)]

Chemistry, Physical Properties and Pharmacology.

Chemically, "Pentothal Sodium" is sodium ethyl (1-methyl butyl) thiobarbiturate, the molecule thus containing sulphur. The replacement in the molecule of one of the oxygen atoms with a sulphur atom distinguishes "Pentothal Sodium" from "Nembutal" and apparently determines its instability in the body. "Pentothal Sodium" is supplied as a yellowish powder in glass ampoules containing either 0·5 or 1·0 gramme, along with which are provided 10 or 20 cubic centimetre ampoules of sterile water for the dissolving of the powder to make a 5% solution. This solution is alkaline, so that no special precautions beyond the ensurance of sterility are necessary as regards the water used for boiling or rinsing the syringes. The powder is very soluble and the solution is of a pale yellowish colour, effervescing slightly when first made and emitting a sulphurous or "garlicky" odour. This reaction soon ceases, and the injection may then be given. While the solution will retain its potency for several hours, it is best used without undue delay; the most certain and consistent results will be obtained with a fresh preparation. The 5% solution is the strongest permissible for intravenous injection. When syringes of 20 cubic centimetre capacity are difficult to obtain there is a temptation to make a 10% solution, so that a syringe of 10 cubic centimetre capacity will accommodate the dose of 1·0 gramme. Not only does this practice demand careful administration to avoid overdosage, but it is frequently followed by venous thrombosis. In addition, the perivenous injection of such a strong solution will produce a severe reaction and probably sloughing. Even the 5% solution may have these effects, and the tendency for some time at the Mayo Clinic has therefore been to use a 2·5% solution. In general, however, the 5% preparation is the most convenient and is reasonably safe.

"Pentothal Sodium" is essentially an hypnotic, and it appears to have a selective effect on the hypothalamic nuclei; this possibly accounts for its pronounced sedative action on the sympathetic division of the autonomic nervous apparatus. This property tends to favour the development of parasympathetic manifestations, such as laryngospasm and bronchospasm. Therefore atropine should be given in full doses whenever possible before "Pentothal Sodium" is administered. "Pentothal Sodium" is a powerful respiratory depressant, and if given too rapidly will arrest breathing completely, although this effect will soon pass off if the injection is at once suspended. This action on the respiration is the main guide to dosage, which is regulated from minute to minute as the depth of breathing varies. In the earlier stages of the administration there is a moderate fall of the blood pressure, which is evidently caused by relaxation of the arterioles and not by any noxious effect on the endothelium of the capillaries. This leads to a moderate degree of tachycardia, presumably of compensatory nature. The institution of surgical procedures seems to hasten circulatory adjustments and the blood pressure is soon restored to normal levels.

A remarkable property of "Pentothal Sodium" is the increased suggestibility produced in patients as the injection begins to take effect. Therefore nothing should be done to alarm or upset the subject at this stage, when some encouraging or laudatory remark on the part of the anæsthetist will not only favour better anæsthesia, but will minimize troublesome after-effects. Injudicious comments, noise and the performance of draping or other preparations while the patient is actually "going under" may result in "bad" anæsthesia and a restless, truculent, noisy and generally non-cooperative patient afterwards. Provocative remarks made by his bed-neighbours as he is recovering may have similar effects.

Indications and Limitations.

"Pentothal Sodium" is essentially an anæsthetic agent for shorter operations performed on peripheral structures,

although experience and cooperation on the part of both surgeon and anæsthetist will greatly increase its scope. Such operations must not necessarily be of minor nature, especially when the immediate surgical requirements only are to be dealt with. Many of the operations performed in forward areas are essentially provisional and not radical; they are completed without undue delay and with as little disturbance to the patient as possible. "Pentothal Sodium", in its rapidity of action, the freedom from delirium and struggling it provides, its low toxicity and the absence of after-effects, contributes greatly to a favourable outcome in such circumstances.

A consideration of the limitations of the drug may best illustrate its field of usefulness. These limitations may be absolute or relative, largely depending on the skill and experience of the anæsthetist and on the facilities at his disposal. The surgeon's approval and interest are essential factors in the production of satisfactory results. The availability of oxygen and of apparatus for its efficient administration greatly increases the scope and safety of "Pentothal Sodium", which may then be used in circumstances otherwise quite unsuitable. The following are the chief contraindications to its use.

Severe Surgical Shock.

Neither "Pentothal Sodium" nor any other anæsthetic agent should be given to patients in a condition of severe surgical shock, and except in the utmost urgency any surgical interference, however brief, should be prohibited. In such cases restorative measures, especially blood transfusion or the administration of plasma or serum, which has recently given excellent results, are imperative preliminaries to narcosis and operation. In the last war, when the nature and treatment of shock were not well understood, the condition of patients coming to operation was often so bad that the giving of chloroform or ether involved grave risks, while the use of nitrous oxide and oxygen resulted in a much-reduced mortality rate.[12] Restorative measures (resuscitation) are now so efficient that ether and even chloroform, or at any rate the "C_2E_3" mixture, may be used with comparative safety in almost all cases, so that the need for nitrous oxide and oxygen anæsthesia is not nearly so imperative. Under the present-day conditions of mobile warfare, too, the bulky nature of the gas supplies and apparatus greatly impairs their usefulness, especially in forward areas.

The use of "Pentothal Sodium" in shock has been questioned because of the transient fall of blood pressure that may occur during the earlier stages of the administration. This feature is largely a sign of mild overdosage produced by the relatively massive initial quantity commonly given, an easily controllable factor. "Pentothal Sodium" behaves like all other general anæsthetic agents in shock; the amount required to produce a given effect is much lessened in comparison with the needs of normal patients. Therefore, slow and careful administration will guard against any serious fall of blood pressure, which, as was explained earlier, is not of noxious origin. It is apparent that with skilful administration the use of "Pentothal Sodium" should involve no great risk in moderate grades of shock, and that if proper resuscitation can make chloroform safe, even more so should it enhance the safety of the much less toxic drug. Usually these patients will have had substantial amounts of morphine, and remarkably efficient and smooth anæsthesia will be produced by quite small doses of "Pentothal Sodium". In fact, whereas difficulties may be encountered with patients in full health, those suffering from shock or exhaustion are remarkably easy to anæsthetize with it.

Conditions of Respiratory Embarrassment or Obstruction.

Any condition of reduced vital capacity or impaired pulmonary ventilation contraindicates the use of "Pentothal Sodium", unless special facilities for preventing or dealing with emergency developments are at hand. Sucking chest wounds, pneumothorax, hæmothorax, pleural effusions and empyema cavities; gross emphysema, extensive pulmonary fibrosis, cavitation and malignant infiltration; gross abdominal distension from fluid, gas or tumours, laryngeal œdema; retropharyngeal or peritonsillar abscess and Ludwig's angina; all these will require most careful consideration and a review of facilities before a decision to use "Pentothal Sodium" is made. Asthma and bronchiectasis or lung abscess carry two peculiar dangers; in the first the parasympathetic hyperactivity induced by "Pentothal Sodium" is apt to result in violent bronchial and general expiratory muscular spasm, and in the second the risk of bronchial inundation with pus is a very real one. It is in this whole series of cases that oxygen can be an invaluable help.

Operations Likely to Hinder the Maintenance of a Clear Airway.

"Pentothal Sodium" is not suitable for operations of any great magnitude or duration about the face or in the nose, mouth or throat, because in such circumstances it is often difficult to maintain a clear airway, even by artificial means. In addition, blood, secretions *et cetera* are apt in the absence of suitable precautions to reach the larynx and cause troublesome coughing and laryngospasm. If the quantity of such foreign material is large, fatal asphyxia may occur from its inhalation, and for this reason a warning has been given against the use of "Pentothal Sodium" in facio-maxillary work.

Extensive Major Surgical Procedures.

Although it is possible to perform long and extensive operations under "Pentothal Sodium" anæsthesia alone, this practice is in general not recommended. It is best in such cases to use "Pentothal Sodium" only for the induction and early maintenance of anæsthesia, with a dosage limit of 1·5 or 2·0 grammes, and then to continue with gas (if available), ether, or the "C_2E_3" mixture. If larger doses are given subsequent narcosis tends to be unduly prolonged, with added risks of pulmonary complications. The progressively increasing intermittency of the injections, especially in the later stages of long administrations, favours the formation of clot in the needle, which may necessitate an unforeseen change to some other method.

"Pentothal Sodium" is likely to be unsatisfactory in operations on sensitive structures or areas, such as the peritoneal cavity or the hands or feet, unless the dosage is large. Its use even as a basal narcotic is questionable in such circumstances, because the depressant effect on respiration will hinder the subsequent introduction of inhalational agents. Nevertheless, "Pentothal Sodium" may be invaluable for purely inductive purposes when violent delirium is expected in this stage. The change-over to ether or "C_2E_3" is aided by concurrent use of carbon dioxide for a few minutes. Naturally, if gaseous agents, and especially cyclopropane, are available in such circumstances, "Pentothal Sodium" as a preliminary is ideal. Another objection to "Pentothal Sodium" as an anæsthetic agent for prolonged operations is the necessity for refilling syringes or for having some special device for giving large quantities of the drug. Further, if difficulties are experienced with the airway, the unassisted anæsthetist will suffer much anxiety.

Soldiers are usually robust subjects, addicted to excessive smoking and exposed to much nervous strain and physical hardship. They will often tolerate or resist the action of narcotizing agents to a remarkable degree, and for many years they have been regarded as notoriously difficult subjects for anæsthesia. "Pentothal Sodium" may be unsatisfactory in such cases for even comparatively minor and superficial operations, especially if the preparation and premedication have been inadequate. It is not surprising to find that something more potent than "Pentothal Sodium" is required for long operations in these circumstances. It may be used with advantage, however, as an adjuvant to local or spinal analgesia in such cases, provided that dosage is under strict control and the blood pressure is carefully watched. Various devices for such prolonged administrations have been described; they usually involve the addition of "Pentothal Sodium" in weak solution (0·5% to 2·0%) to a continuous infusion of normal saline solution.[12]

Operations on Patients in Difficult Postures.

Operations on patients in difficult postures and when the ordinary sites for injection are not accessible may preclude the use of "Pentothal Sodium". Similarly, when the position of the patient has to be changed at some stage of the operation, difficulty may be experienced in keeping the needle in its proper location. Veins are usually difficult to relocate and reenter when so lost, and if this happens, it may be best to continue anæsthesia with some inhalational agent. It is always important, before the intravenous injection is begun, to place the patient in the position in which the operation will be performed. If the arm veins are unavailable for some reason, one on the back of the hand or in the leg or foot may be used, although a satisfactory alternative will often be found in the neck. This last site is especially advantageous, because the anæsthetist is enabled readily to observe and control the airway. Varicose veins should on no account be used for the injection, because pooling of the solution may occur and lead to subsequent massive dosage. For a similar reason the underlying arm of patients in the lateral position may not be suitable, since the axillary veins are apt, when the patient relaxes, to become compressed, the venous return from the site of injection being prevented.

Operations on the External Genitalia.

Operations on the external genitalia, especially circumcision, and on the anus and rectum, may not be entirely satisfactory under "Pentothal Sodium" anæsthesia. In the first case troublesome erection of the penis may occur, and in the second inadequate relaxation and reflex laryngospasm will be likely unless heavy dosages are employed.

States of High Intracranial Blood Pressure.

States of high intracranial pressure due to injury, abscess, tumour *et cetera* involve a progressive impairment of the blood supply to vital nervous centres, and any sudden fall of blood pressure, such as may occur with the use of "Pentothal Sodium", introduces the risk of serious cerebral anæmia.

Preparation and Premedication.

The common experience that patients for general anæsthesia react more favourably if rested beforehand applies to "Pentothal Sodium". Whenever possible, activities should be curtailed and disturbances avoided for several hours preceding its administration. This of course may not be possible under service conditions. While it is advisable to impose the usual dietetic restrictions, it is not imperative for the stomach to be empty when the drug is given. In fact, in many cases light foods and fluids may be taken with benefit to within two hours of the operation. "Pentothal Sodium" itself does not cause vomiting, and unless the pharyngeal reflexes are excited in some way, vomiting, with its dangers to the unconscious patient, is not likely to occur. The drinking of large quantities of fluid, however, should be avoided immediately before administration of the drug, because simple regurgitation, unaccompanied by any expulsive effort, is apt to occur if the cardiac sphincter relaxes. The pharynx then becomes flooded and violent coughing and laryngospasm will be induced.

Whenever possible, premedication should be given before "Pentothal Sodium" is used; this comprises morphine in moderate dosages (one-sixth to one-quarter of a grain) and atropine in full dosage (one one-hundredth to one seventy-fifth of a grain), to be injected hypodermically at least one hour before the operation is timed to begin. The use of atropine is really imperative. It not only inhibits the formation of secretions, which may gain access to the larynx and so induce coughing and laryngospasm, but it also offsets the tendency to parasympathetic hyperactivity, which favours the development of these complications.[(4)] If there is insufficient time, one one-hundred-and-fiftieth of a grain of atropine, injected intravenously as soon as the patient arrives in the operating theatre, will give good results.

The use of morphine as a preliminary measure is generally desirable, because the combination of its analgesic properties with the hypnotic effects of the "Pentothal Sodium" considerably improves the anæsthesia. The depressing action of both drugs on respiration must not, however, be overlooked, and at times it is advisable to omit the morphine. Very often battle or air-raid casualties will have had large and repeated doses of morphine, a possibility demanding some attention before more is ordered. The use of other barbiturates, such as phenobarbital, as premedicating agents, is not considered advisable, because they are apt to favour the development of post-anæsthetic delirium. A similar consideration applies to the use of hyoscine instead of atropine, although it is a useful substitute for inhibiting secretions when the other is not available. Heroin, "Omnopon", "Pantopon" *et cetera* are superior to morphine, since they rarely cause nausea or vomiting; but of course these are luxuries under war conditions.

Technique.

"Pentothal Sodium" is a potent drug, and the employment of the intravenous route of administration demands care and judgement, but also permits of such positive and delicate control of dosage as to offset the few possible dangers.[(5)] It is advisable for beginners to have demonstrations and supervised trials of its use, if these can be arranged. Obviously, a correct location of the needle in a vein is essential to successful results, and the injection should not be proceeded with if any uncertainty exists in this regard. The slightest resistance to the inflow or the appearance of a swelling or fullness about the needle point suggests an incorrect location. In such circumstances the injection should be at once suspended and a check made before it is resumed.

The syringe, preferably of 20 cubic centimetre size and with an eccentric nozzle, should have a well-fitting piston to prevent air leaks when the test of location by aspiration is performed. If possible, it should be reserved entirely for intravenous work. Two types of needle are required: a large cannula for mixing purposes and several needles of medium size for the injection. They should be sharp, with a hollow-ground long bevel. Short bevel, flat-ground needles are often so blunt as to prevent any delicacy of technique. Blunt needles of any kind are a great hindrance to success in venipuncture; they will not enter the vein cleanly and are apt to transfix it instead. In attempts to enter veins that are not well supported by the surrounding tissues, as on the dorsum of the hand and in the neck, it is essential to have very sharp needles of somewhat finer gauge than those required for other locations. The puncture is easier if made in a venous bifurcation and if tension is applied to the skin distal to the site so as to fix the underlying vessel. A combination of breath-holding and expiratory straining, sustained for a few moments, will make the neck veins distend and so easy to locate. Fear and cold will sometimes cause veins to become contracted and so difficult to enter, and the application of heat will often make them dilate sufficiently for the purpose in view. The use of a tourniquet is ordinarily not necessary, simple manual compression of the arm being all that is required when this site of injection is employed.

Two main factors are involved in the actual administration of "Pentothal Sodium"; there is no fixed dosage ("What is the dose?" is a frequent query), and a perfectly clear airway must be maintained throughout so that the diminished respiratory efforts shall not suffer the slightest hindrance. In general, the depth of the breathing is the indication by which dosage is judged; as anæsthesia lightens, breathing becomes deeper and more "Pentothal Sodium" is then required. If obstruction occurs, breathing will certainly become deeper, but in a laboured manner, and up to a point, despite the giving of further quantities of the drug. Care must be taken not to fall into this error, because when the airway is restored and the carbon dioxide tension in the lungs consequently falls, a disconcerting period of shallow breathing or apnœa will follow.

To ensure a clear airway a low pillow should be allowed, the head being half-turned to one side and slightly extended on the neck. If this is insufficient, support of the

mandible at the chin or one angle will often produce the desired result. If this also fails, an artificial pharyngeal airway should be inserted, but not until the patient is well under the influence of the drug, since otherwise laryngospasm or coughing may be induced. No attempt whatever should be made to perform tracheal intubation under "Pentothal Sodium" anæsthesia alone; either preliminary local analgesia of the larynx or the use of supplementary inhalational agents is essential if spasm and possible damage are to be avoided. With these aids intubation may be satisfactorily performed, and the administration of "Pentothal Sodium" may then be resumed.

Induction is best performed while the patient counts slowly, the solution being injected at the rate of about one cubic centimetre in each five seconds. When counting ceases the injection is suspended for one minute and the patient's condition is then ascertained. In all probability anæsthesia will not yet be deep enough for the operation to be commenced, and so further intermittent injections of from one-half to one cubic centimetre are given, a pause of at least thirty seconds being allowed between them. The combined volume of these supplementary injections should not amount to more than one-half of the quantity of the initial injection; that is, if four cubic centimetres were required to cause the patient to stop counting, anything up to a further two cubic centimetres, in divided doses, will produce full anæsthesia. Thereafter additional amounts, or from 0·25 to 0·5 cubic centimetre, are given intermittently as indications arise (deeper breathing, slight movement of the patient *et cetera*). The patient's reactions are at all times the criteria of dosage, and these vary considerably with each individual subject. It will be found that as the duration of anæsthesia lengthens, the need for additional quantities of the drug will become progressively less frequent. The handling of sensitive structures, however, should be anticipated by a small extra dose whenever required. It is best to detach the syringe from the needle when refills become necessary, so as to avoid difficulties in relocating the vein. The needle is left *in situ* and an assistant should exert gentle pressure in the region of its point to prevent the escape of blood or the entry of air while the syringe is detached.

Apart from the corneal reflex, the ordinary ocular signs of anæsthesia are quite useless with "Pentothal Sodium". Usually throughout the administration the pupils will be small and will react briskly to light. Occasionally they will be dilated, especially if the patient is afraid or if he is subjected to some alarming stimulus during the induction. In general, maintenance is so conducted as to have the corneal reflex just absent throughout. The frequent eliciting of this sign is not advisable, because the reflex mechanism becomes fatigued and so is made unreliable.

A moderate increase in the pulse rate will usually be observed, especially in the earlier stages of the administration. This is of little consequence, being merely a compensatory phenomenon, as was explained earlier. It runs parallel to variations in the blood pressure and tends to revert to normal when circulatory adjustments have taken place. There is no evidence that the variations in the pulse rate and blood pressure are due to either cardiac or capillary damage.

Very shallow or arrested breathing is likely to be the commonest cause of alarm during the use of "Pentothal Sodium". If this situation is serious, a progressively increasing cyanosis will develop. This will readily respond to a few compressions of the chest or to the insufflation of oxygen, if available. Obviously, overdosage is aggravated by excessive premedication with morphine or other sedatives. Such overdosage is usually attributable to a too-rapid injection of the solution, often practised in an attempt to control coughing or other unusual reactions. Occasionally cyanosis is due to laryngospasm, induced by irritation of the larynx by saliva, blood, vomitus or the end of an artificial airway. This shows how "light" the patient really is, and all that has to be done is to support the jaw firmly, clear the pharynx if necessary and slightly withdraw the airway. Breathing will soon be resumed, and if the intrapharyngeal insufflation of oxygen or carbogen can be practised, anxieties will be alleviated all the sooner. It cannot be too strongly emphasized that oxygen, efficiently administered, is the best antidote to overdosages of "Pentothal Sodium" and that analeptics like lobeline, "Coramine", picrotoxin *et cetera* are of secondary importance in any emergency developments.

As has been stressed already, no interference with the patient is permissible during the induction stage. At this time patients are very suggestible, a property of the drug which may be used to great advantage, but which if abused will lead to undesirable reactions during and after the operation. No restraint should be imposed, and draping or skin preparation should be suspended during the induction so as to avoid upsetting the patient. It is also important not to begin the operation before he is well under the influence of the drug. As a rule about two minutes will be required for the full induction of anæsthesia and for respiration to become stabilized after the initial tendency to apnœa. If the operation is begun too soon, reflex movements may be induced and will tend to persist, to the embarrassment of both surgeon and anæsthetist. Warning should always be given of the possibility of such occurrences, especially when sensitive areas like the great toe or the palm of the hand are the site of operation. If necessary the limb should be strapped down or the assistant should hold it firmly while the initial incision is made. Generally these reactions are not persistent, and once the operation is well under way they no longer recur, but if they do, a change to an inhalational agent is indicated.

When the operation is completed care must still be taken to ensure patency of the airway, especially during the transportation of the patient back to his bed. Whenever possible he should be put in the lateral posture, which should be maintained until recovery from the effects of the drug is complete. In this position the jaw and tongue will fall laterally and forwards, ensuring a clear airway and facilitating the escape of any foreign material from the mouth and pharynx.

Complications.

Complications are generally of minor nature, and reference has already been made to most of them, especially those likely to occur during the administration. A brief recapitulation only will be given here.

1. Respiratory depression is an inherent property of "Pentothal Sodium", and its degree is easily regulated by careful technique. Overdosage involves two controllable factors: the quantity given and the speed of administration. Both are variables, and the significance of each must be estimated from a consideration of the individual patient's reactions as exhibited from minute to minute.

2. Laryngospasm, coughing, sneezing, bronchospasm and hiccup are largely manifestations of parasympathetic hyperactivity, which may occur or be induced in some cases. Suitable premedication will reduce their incidence.

3. A fall of blood pressure and compensatory tachycardia commonly occur in the early stages of the administration. They are persistent only when unnecessarily large doses of the drug have been given.

4. Movements interfering with the operation sometimes occur in nervous patients or when sensitive areas are stimulated under light anæsthesia. Their control has already been indicated.

5. Prolonged narcosis generally follows large doses of the drug, often given unnecessarily in the later stages of relatively long administrations. It involves an increased risk of pulmonary complications.

6. Restlessness during recovery from the effects of the drug occurs much less frequently with "Pentothal Sodium" than with "Evipan Sodium", and can be readily controlled with morphine. The factors involved in its occurrence have already been discussed.

7. In perivenous injection of the drug, if more than a few cubic centimetres of the solution are injected outside the vein, a tender swelling will appear in a few days and sloughing may occur later. The frequent application of hot moist compresses will relieve pain and favour resolution.

8. Venous thrombosis will occur if the solution employed is too strong. The clot is very firm and extends

upwards from the site of the injection to the next proximal venous junction. It may be tender for a time, but ultimately shrinks to form an almost impalpable fibrous cord.

9. Although there is little evidence that barbiturates will cause agranulocytosis, their avoidance is advisable when it exists or is threatened. This warning applies especially to cases of gross sepsis or toxæmia in which large doses of sulphonamide derivatives have been employed.

Personal Experiences.

Apart from the routine use of "Pentothal Sodium" in base hospitals, where its applicability resembles in most respects that of civil practice, some reference to experiences with it in more advanced areas is not inappropriate. Although small in number, the battle casualties dealt with did emphasize the fact that the drug is really indispensable, especially for use under adverse conditions.

A man with a shattered leg required its manipulation and fixation in plaster of Paris late one night. The frequent air-raid warnings made stringent lighting restrictions imperative, and although the newly erected and rather crowded tent was carefully closed, only two dim hurricane lamps were permissible. The patient was of strong build, but he was very tired, and so far as could be ascertained he had been given two injections of morphine during the evening. There was only slight evidence of shock. The inflammability of ether precluded its use, and chloroform was not an attractive alternative. "Pentothal Sodium" gave admirable results; 14 cubic centimetres of the 5% solution (0·7 gramme) provided excellent anæsthesia of fifteen minutes' duration. The patient was semi-conscious a few minutes after the operation and subsequently had a good night's rest in spite of his disturbing environment. He had no after-sickness and next day was quite fit for the evacuation, which took place in rather exciting circumstances.

Some days later the anæsthetist of a British hospital required assistance, because he was much overworked. He had been in action almost constantly during the preceding fortnight and had been using mainly "Pentothal Sodium". It is interesting to note that only about one month previously he had stated that he was using almost exclusively nitrous oxide and oxygen, or the nitrous oxide, oxygen and ether mixture, and that he had had practically no experience of "Pentothal Sodium", although ample

FIGURE I. Preparation of the solution.

supplies were on hand in the hospital dispensary. Now, and despite available supplies of nitrous oxide and of oxygen, he found in "Pentothal Sodium" the only satisfactory means of dealing with the great volume of work he had to do. Thus it happened that, from 1415 hours on one afternoon 12 cases of a variety of gunshot wounds were dealt with by 1930 hours—that is, in exactly five and a quarter hours—by the one team, comprising surgeon, anæsthetist, one sister and one orderly. The duration of each operation averaged twenty-one minutes, the shortest taking ten and the longest sixty minutes. "Pentothal Sodium" was used in each case; no supplementary anæsthetics were employed, and circumstances made it impossible to give any premedication, although it is probable that many of the patients had had substantial amounts of morphine since the receipt of their injuries. The wounds were mainly of the extremities, and in several cases they were multiple; one man had penetrating wounds of the thorax and pelvis, and another penetrating wounds of the flank and skull (the last involving the brain). All patients took the anæsthetics well and no anxieties arose. The records made at the time show that the total duration of these operations was four and a quarter hours, so that

FIGURE II. Operation in progress.

only one hour in all was occupied in the incidental transportation and preparation of the whole 12 patients. It seems that no other anæsthetic agent, with the possible exception of cyclopropane gas, could have produced such results. Without "Pentothal Sodium" a large volume of the work would either have remained undone or have taken much longer to do. Alternatively, increased staff and operating theatre facilities would have been required to ensure the completion of the work in a reasonable time.

FIGURE III. Awaiting patient's recovery.

Eventual developments in this campaign involved few opportunities for organized work; but "Pentothal Sodium" was used on five occasions for minor surgical procedures (four dental and one orthopædic) with satisfactory results. These anæsthetics were given in the open under olive trees, with no facilities other than those provided by a small anæsthetic case, of which possession was fortunately retained throughout a time of crisis. The accompanying photographs (Figures I, II and III) will give some idea of the conditions under which these operations were done. It is probable that much suffering was alleviated by

means of this agent during the subsequent unique battle which took place in this area.

Conclusions.

1. "Pentothal Sodium" is a suitable anæsthetic for a large proportion of the operations performed under service conditions, especially in forward areas.

2. Experience with both air-raid and battle casualties shows that the drug is really indispensable.

3. A knowledge of the properties and use of the drug may be readily acquired, especially if facilities for instruction and supervised trials of its use are organized.

4. "Pentothal Sodium" is a powerful respiratory depressant, a property demanding careful technique and yet providing the indications by which the dosages required are estimated.

5. It has virtually no intrinsic toxic properties, but adequate oxygenation of the subject must be ensured during its use.

6. Its action is rapid and positive; the anæsthesia produced is generally satisfactory and deleterious after-effects are rare.

7. Complications arising during or after its use are of minor nature and generally attributable to errors of preparation and technique, which are largely avoidable.

8. The drug has certain limitations, which must be respected if uniformly satisfactory results are to be obtained from its use.

9. The suggestibility of patients during certain phases of "Pentothal Sodium" narcosis may be turned to great advantage, yet care is necessary to avoid its abuse.

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EXAMINATION OF RECRUITS FOR THE ARMY.[1]

By R. J. TAYLOR,
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WHEN it is realized that many men, discharged from the army as permanently unfit, have been in camp for periods averaging from six to twelve months, that during that time they have been paid, fed and clothed, and that a fair number of them will have legitimate claims for pensions on account of newly acquired disabilities or of aggravations of old ones, the serious financial burden on the community becomes apparent. That so many have remained in the army for so long without their disabilities being discovered is astounding and outside our sphere; but it may not be inopportune to point out that quite a number of these men have, by various means, secured sheltered jobs in orderly rooms, quartermasters' stores, cook-houses, officers' messes *et cetera*, and that their physical and mental defects have been brought to light during manœuvres carried out shortly before their draft was due to proceed overseas. The remedy of this is obvious.

Through the courtesy of Lieutenant-Colonel C. L. S. Macintosh and of Captain C. O. Donovan, I have been enabled to show you two sets of figures indicating the main causes of rejection and discharge. The outstanding feature of these figures is the high percentage of orthopædic conditions. The remainder of the rejections are for various disabilities, such as "general grounds", excessive age, chronic alcoholism, tremor, recurrent thrombophlebitis, malaria, Hodgkin's disease, obesity, speech defect, recurrent epistaxis, enuresis *et cetera*.

TABLE I.

Causes of Discharge and Rejection.	Percentage of 900 Discharges from A.I.F. Camps in N.S.W.	Percentage of 604 Rejections of 5,714 Volunteers.
Defects of lower extremities from fracture, contraction, luxation *et cetera*	18·2 } 23·5	9·5
Flat feet	5·3 }	
Defects of upper extremity	1·7	1·8
Diseases of joints and other affections of bone and muscle	7·2	1·5
Diseases of digestive system	11·6	8·3
Diseases of nervous system: neurasthenia, defective intelligence, visceral neuroses *et cetera*	8·1	6·6
Epilepsy	3·0	0·8
Diseases of lung and respiratory tract (except tuberculosis)	6·2	2·3
Pulmonary tuberculosis	1·0	—
Head injuries and post-concussion syndrome	3·0	7·5
Hernia and laxity of abdominal rings	1·2	5·0
Diseases of heart:		
(*a*) Organic	1·3 }	8·2 }
(*b*) Functional	1·1 }	4·6 }
	4·4	5·0
Diseases of ears, including deafness		
Diseases of eyes: defective vision, conjunctivitis *et cetera*	4·0	3·6
Inveterate skin diseases	1·3	4·4
Varicose veins	0·8	3·6
Poor physique	—	6·8
Varicocele	0·8	0·3
Syphilis and other venereal diseases	1·5	0·3
Diseases of urinary organs: nephritis, pyuria, renal colic	1·7	5·8
Diabetes mellitus	—	1·0
Diseases of the thyreoid gland	—	2·3

Broadly, these discharged men may be grouped as follows: (i) those whose disabilities were missed by the examiner; (ii) those whose disabilities were seen and noted and not considered sufficient to debar the recruit from Class I; (iii) those who, wilfully or otherwise, failed to reveal their ailments; (iv) those who became ill or broke down during training; (v) those who honestly did not know that they were physically or psychologically unfit for service; (vi) those who never had any intention of seeing active service.

[1] Read at a meeting of the New South Wales Branch of the British Medical Association on September 25, 1941.

Let us consider each group separately.

With regard to the first group, it may be said that medical examiners, for the most part, are chosen from the ranks of busy general practitioners, men with a wide knowledge of medicine and surgery, a great understanding of human nature, and a deep sense of responsibility. Mistakes have been made, mistakes will be made—*errare est humanum*. How can they be minimized? Noise and hurry, not carelessness or ignorance, are, I think, the greatest causes of error. There is nothing so distracting to a medical examiner as noise; loud voices and heavy boots are the bugbears. The atmosphere of the examination room should be one of quiet; otherwise a case cannot be considered calmly, soft heart murmurs and breath sounds cannot be heard, and blood pressure cannot be accurately estimated. This is one reason why tests of vision should be conducted in a separate room. A floor covering of thick linoleum in the examination room would be helpful. Hurry is inexcusable but inevitable, when, towards the end of a long day, everyone being tired and hungry, a fresh batch of recruits is brought along for examination. This should be arranged differently. I know that this group comprises the smallest number, and before leaving the subject of the examiners themselves I should like to express my admiration of the courtesy and patience they have shown to all types of would-be soldier.

The second is a large group and comprises men with such conditions as minor degrees of flat-foot and hammer-toe, corns, varicose veins, varicocele, tachycardia, "borderline cases" of defective hearing and vision, and so on. All these men stoutly aver that they do laborious work in civil life and have no trouble, and the examiner, in his desire to save as much man power for the army, gives them the benefit of the doubt. This procedure, adopted in most instances after consultation, is absolutely justifiable, but unfortunately the test of service conditions proves too much for the recruit.

The third is another large group, in which no diagnosis can be made without the history; it consists of epileptics, asthmatics, chronic bronchitics, dyspeptics, and past sufferers from rheumatism and rheumatic fever, peptic ulcer, cerebral concussion *et cetera*. We are powerless against this class of subject, as physical examination often reveals no abnormality. Luckily, intensive training brings most of them to light before the recruits leave these shores. The penalty clause in Form D.I. does not appear to have acted as a deterrent.

The fourth group does not concern us.

In the fifth group we have a large number of men who have not been used to hard physical exercise and have not the stamina, mental or bodily, to stand up to privations. Many cannot put up with the daily companionship of Tom, Dick and Harry; others resent being ordered about in peremptory fashion; others frankly admit that they hate the rough life; others complain that the food is monotonous and tasteless. Many more worry about the security and happiness of their wives and children and other dependants. In this group will be found men suffering from the various visceral neuroses—neuro-circulatory asthenia, functional dyspepsia, insomnia, headache, pain in the back, painful feet, aching varicocele *et cetera*. They will not become efficient soldiers.

In the sixth sad group come those who, just prior to embarkation, begin to develop various symptoms for which no physical sign can be found to account. The complaints are many and varied—persistent headache, rheumatism, indigestion, vomiting, metatarsalgia, pain in the neck, enuresis, faintness, giddiness, inability to wear a steel helmet, defective vision and hearing, and so on *ad infinitum*. There is no doubt that many men "boarded out" for orthopædic disabilities belong to this category. It is hard to know what to do with these men; disciplinary measures might be tried; but I feel that it would not be much use trying to keep them in the army.

From the foregoing remarks it can easily be understood that the task of the medical examiner is no easy one and that in spite of every care men will be enlisted who will never become efficient soldiers. We have been blamed in the past and shall be blamed in the future; but most of the criticism is unjustified. I should like to offer a few random suggestions before handing the subject over to my audience.

I think that additions to Army Form D might include inquiry into a previous history of rheumatism of any kind, of susceptibility to winter coughs, of a family record of epilepsy, migraine *et cetera*. It would be helpful, too, if recruits, while waiting for examination, were asked to read through the questions that they were to be asked, so that they might have their answers ready (tactful attention being drawn to the penalty clause). The points in the *questionnaire* should be put deliberately by the examiner, and it is at this time that he has the opportunity of estimating the recruit's mentality, his psychological background and his hearing. A man who is a little too meticulous about his previous minor ailments becomes immediately suspect, and the deaf are discovered by the quiet already enjoined. Mental deficiency is not always the easiest thing to assess. Recently a batch of 70 dairy farm workers from the North Coast came for examination. They seemed to me the dullest clodhoppers imaginable; but my colleague suggested that we should take into consideration their mode of life and the fact that contact with their city brethren combined with drill would soon make them mentally alert. I am sure he was right.

Discussion.

When he is in doubt on any point the examiner usually asks the opinion of one or more of his colleagues. Care should be taken that the recruit gets no inkling of the part of his anatomy that is under suspicion; the method of indirect approach should be used, and he should not be allowed to overhear the discussion. It is most undesirable that a man's attention should be drawn to such things as heart murmurs, varicocele, flat-feet *et cetera*.

Every scar should be noted in the examination form. This is important from the point of view of identification, and also to forestall later claims that such scars were caused on service. Much useful information may also be gathered by an inquiry into the cause of scars. An unconfessed epilepsy may be disclosed by the presence of multiple scars of the face, scalp and tongue.

It seems to be well established that men who have suffered from a fractured skull or from cerebral concussion do not make efficient soldiers. The stress and strain of service soon bring out the post-concussion syndrome, headache, giddiness, inability to stand heat or the weight of a steel helmet *et cetera*. In addition to asking the recruit about previous head injury, it is advisable to palpate the cranium and search for depressions and irregularities of the bone. On account of the *penchant* of the modern youth for greasy pomades, this is not always a pleasant procedure. Upper abdominal scars should be treated with suspicion, and close inquiry into their origin should be made. Most of them lead to the recruit's rejection. Long puckered scars in the lower part of the abdomen are also a source of trouble, and may later evoke symptoms which can be backed up by a radiological report of peritoneal adhesions.

All men with incisional hernia should be rejected. Patency of the abdominal rings in the absence of a true hernia, or a bubonocele should not debar the recruit from acceptance.

Examination of Lungs.

Knowledge that an X-ray examination will be made later has rendered the examination of the lungs less thorough than would otherwise be the case. Pulmonary tuberculosis in its early stages is notoriously difficult to diagnose clinically. However, these lesions are usually picked up by X-ray examination. But chronic bronchitis—a common disability, particularly in men aged over thirty years—should be remembered if a loose cough is evoked by deep inspiration, if congestion of the fauces is present, or if evidence of chronic tonsillar infection is found. The physical signs in the lungs may vary from nothing to harsh breath sounds and prolonged expiration at the base

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posteriorly, with or without râles or rhonchi. The X-ray limits of normality, particularly in city dwellers, are so wide that true clinical bronchitis is frequently missed by the radiographer and can only be diagnosed clinically. Chronic bronchitis is a fairly frequent cause of invalidism, and since the last war has been a common pensionable disability.

Cardio-Vascular System.

There are a few points concerning the cardio-vascular system on which I should like to comment.

Tachycardia.—Many recruits are excited and nervous when being examined; many are tired and hungry. If the pulse rate remains rapid after the man has been reassured and given time to become used to his surroundings, he should be made to lie down for half an hour. If the rate is then still fast, his examination should be deferred till the following day. If tachycardia persists, especially if he is of the nervy, introspective type, with cold, clammy hands and pronounced axillary sweating, he is probably suffering from neuro-circulatory asthenia, and should be marked unfit for Class I. Only sons seems to be particularly prone to this condition.

Heart Murmurs.—In the absence of a history of rheumatic fever, soft mitral systolic murmurs should not disqualify a recruit; but loud systolic murmurs heard all over the precordium, indicating as they do a congenital heart lesion, make the recruit unfit for Class I. These hearts frequently break down under strain, and also are more likely than normal hearts to become the site of subacute bacterial endocarditis. Here I would interpolate my opinion that no man with a history of rheumatic fever should be accepted for any type of military service.

Extrasystoles.—Extrasystoles are generally of no significance and disappear with exercise.

High Blood Pressure.—There are many non-pathological factors which cause a temporary rise of blood pressure—namely, excitement, nervousness, lack of sleep, over-indulgence in alcohol *et cetera*. When the blood pressure is found to be over 160 millimetres of mercury systolic and 90 diastolic, the recruit should be made to lie down for half an hour or more and further readings should be taken. If these are not satisfactory he should be told to go to bed early, take no alcohol and report next day. As much care as possible should be taken to conceal the fact that the blood pressure is under suspicion. If at the second visit the blood pressure has fallen but is still somewhat raised, the man may be deferred for a few days, advised to live quietly and given a bromide or sodium phenobarbital mixture.

Conclusion.

There are no doubt many other points on which I should comment, but I think I have said enough to provoke discussion.

EXAMINATION OF RECRUITS FOR THE ARMY.[1]

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WHEN we are examining recruits for the Army we must have constantly before our mind the type of work that the troops must carry out and the kind of life they will lead generally, and it is in this respect that examinations for military purposes differ considerably from examinations of men, say, for some industrial concern. In war-time the man on active service must have no disability which will require him to sit down and rest for half an hour or so every now and again. A man with some slight defect working in a factory may be able to carry on without any apparent disability; but with a full pack and "on the road to Dunkirk", a man needs to be in really first-class order. So that when we see a man with some very slight disability, we ask ourselves what the tasks are for which this man must be fit. If he has to carry a pack weighing sixty pounds or more for twenty miles over rough country, it stands to reason that any disability that can be passed must be indeed slight. I have frequently seen men referred to a medical board who have been passed by a medical examiner as "fit Class I", who have never been able to complete a route march during their whole period in camp. They have no disability in civil life and can play eighteen holes of golf without disability; but the Army requires much more of a man than this. So that every time you have the slightest doubt, think of a fifteen or twenty miles' march with full pack and under constant harrying by the enemy. Ask yourself how this would feel if the recruit had a painful corn on the little toe or a rigid great toe joint.

Since the object of my part of this discussion is confined to the orthopædic aspect, we must first decide what parts of the body must be examined from the orthopædic standpoint. In a general way it may be said that orthopædic surgery deals with the disabilities of the locomotor apparatus—that is to say, bones, joints, muscles and their associate structures—so that the orthopædic section of your examination will consist of the examination of the spine and the upper and lower limbs and their joints. I feel that the spine is often overlooked, and I have recently seen a man drafted in for training with an advanced degree of spondylolisthesis. It is necessary to examine the range of movement of all joints of the body, and although this sounds a great deal, it can be done in five or six seconds.

Take the spine first. Can the man touch his toes with the knees straight? Can he bend back and look at the ceiling? Can he slide his right and left arms down the outer side of his thighs to the knee joint? Can he twist to the right and left freely? If these movements are carried out and are of normal range and painless, there is probably not much wrong with the spine. If the finger is run down the vertebral column, any gross irregularities can be detected. Scoliosis is a condition which often worries medical examiners, and I think it is safest to regard all but those with slight deformity as being unfit for full duties. If the deformity is slight and if there is a full range of movement in all the spinal joints, I think the man may be passed, providing that his legs and hip joints are normal. In this respect it must be remembered that inequality in the length of the legs or some defect of the hip joint is common in scoliosis.

For the testing of movements in the shoulders and arms, the man raises both arms above the head, puts his hands behind his neck, puts them behind the small of his back, then, holding the elbows at the sides, turns the palms of the hands upwards and then downwards, flexes and extends the wrist, clenches the fist, then fully extends the fingers and thumbs. If this can be carried out, his arm joints are normal.

For the testing of the legs the man stands straight with his feet parallel about six inches apart, raises himself up on tiptoe, then squats down, sitting on the heels, then straightens up again. He then rolls his feet over on the outer side and straightens up again, then bends his knees forward, keeping his soles flat to the floor to test dorsiflexion of the ankle. If any of these manœuvres cannot be carried out with comfort, then a more detailed examination is necessary to discover the cause and to assess the resulting disability. I would here stress the importance of having the man quite naked, because then any muscle wasting or deformity or the presence of varicose veins is immediately obvious. If the man is left with even his underpants on, a hip deformity that is grossly disabling may be overlooked. It is also important to examine the soles of the feet.

It appears to me that, from an orthopædic point of view, the commonest disability found in the examination of recruits is some form of foot trouble. Many practitioners, on sighting any foot disability, immediately classify it as a flat foot and let it go at that. When one has the diagnosis in mind, what is to be done with the man? There is no doubt at all that many men with really flat feet make quite efficient soldiers, and on the other hand there are many men with apparently normal feet who are unable to stand the strain because of inefficient

[1] Read at a meeting of the New South Wales Branch of the British Medical Association on September 25, 1941.

muscle power or poor mobility. A flat foot which is swollen and is supported by poor calf muscles cannot be actively corrected, and naturally cannot be "Class I". On the other hand, a man with slight flat foot but with active muscles which strongly correct this little deformity, who has had no disability in civil life, is not likely to be worried by military service as far as his feet are concerned. The really disabling condition in a flat foot is the gradual development of an osteoarthritis of the tarsal joints, and it is this condition which must be constantly looked for. When the tarsal joints become tender and movements restricted, particularly if there is some swelling of the foot, it is probable that osteoarthritis is developing in the joints, and this is quite disabling.

The class of recruit who is often passed in as having good feet is the man who has a beautifully shaped, high arch, and probably a nice slender foot, so that it is often the object of admiration. However, when carefully examined it is seen that the calf muscles are a little tight, the arch of the foot is rigid and the toes are somewhat contracted. These conditions are a great source of trouble and infinitely worse than the so-called flat foot. The anterior metatarsal arch is lost, and the men suffer pressure pains under the metatarsal heads, and if there is much contraction of the toes, corns are likely to form on their dorsal surface as well. Except when this condition is present in only the slightest grade, I suggest that a man with such feet should never be allowed in as "Class I". There is the trouble also that such a man is much more difficult to treat on active service than the man with flat foot. Any man with a really painful corn cannot be classified as fit for active service with a field formation. But many such conditions can easily be remedied, and such men are preferably marked "temporarily unfit". For instance, hammer-toe with a corn on the dorsal surface is a very serious disability, and yet the usual operation for hammer-toe is almost invariably successful in giving absolute relief.

Another deformity commonly present, and a cause of much disability, is *hallux valgus*. In this connexion I think that if there is more than the slightest degree of deformity it is safer to label the man as "Class II", and if there is any swelling of the joint or associated bursa, the same applies. More important still is *hallux rigidus*, which is a condition of osteoarthritis of the first metatarsophalangeal joint and is grossly disabling. This, of course, would be immediately detected when the man tried to stand on his toes. Corns on the sole of the foot do not necessarily disable a man; but if they are painful and associated with any foot deformity, the recruit cannot be put in the first class.

The question arises as to how much movement must be present in the joint, or rather, how much stiffness can be allowed. Is it necessary to have an absolutely full range of movement in all joints? The answer is, of course, that perfection is not necessary; but in the lower limbs particularly it must be remembered that if there is restriction of movement pain and swelling are also likely to be present, and these are the determining factors. With regard to the elbow, the fact that a man lacked, say, 10° or 15° of extension would not disqualify him if there was no associated pain or swelling, because often in the most energetic times it is not likely that the elbow will be called on for constant or prolonged work. It is the experience of military medical officers that few men who are able to carry out normal working duties in civil life have trouble with their arms in military life. But with regard to the lower limbs, it is common for men able to carry out normal duties to be quite "out of it" during military training.

Recently I saw a young man who regarded his lower limbs as being particularly good, as he belonged to a hiking club, and often at the week-ends would walk for 15 or 20 miles without apparent disability. On this evidence he was regarded as being quite fit as far as his legs were concerned. Experience, however, proved that he was not able to carry out the feat every day, and after a considerable amount of hard marching for one or two days he had some aching in the hip joint for a couple of days. This was slight in civil life, and as he was an office worker the rest to his legs in the early part of the week allowed complete recovery, and he regarded himself as a potential walking champion. However, on military duties it is not the custom of the Army to work on two days and rest for five, so that when this man was put to the test he broke down. Examination then revealed a very slight *coxa vara* deformity due to a slipped epiphysis with slight restriction of movement, and I think that had this man continued hard work he would have been a candidate for osteoarthritis of the hip joint.

With regard to the knee joint, the most commonly debated question is whether the man who has injured his semilunar cartilage or meniscus is fit for field duty. Those of us who do much knee joint surgery rather pride ourselves that in suitable cases a satisfactory operation gives a first-class knee joint, and of course we all know of cases in which a man who has had a meniscus removed has carried out full duties without the slightest disability. My own feeling is that in a healthy young knee joint, if the meniscus is removed before there is a tendency for osteoarthritis to develop, a full recovery occurs. However, the experience in the Army has not been good, so that a man who has had his cartilage removed is rather frowned upon, and I understand the ruling is that he is unable to pass as first class. If a man is really anxious to get into the Army, he reports that the scar on the front of the knee joint is due to a superficial scratch on a piece of barbed wire, and "gets away with it" in this manner. I think that there are two reasons for the apparently bad experience with these knees: first, the tremendous number of patients who have been operated on, so that such knees are relatively common; and secondly, the knowledge of the soldier that his history of knee operation is a satisfactory basis for complaint when he does not feel inclined to carry out a route march. As a matter of fact, I have not seen any great number of men who have undergone this operation "boarded out"; but, on the other hand, I have seen quite a few men in whom one suspects a torn cartilage which has been untreated. These men certainly are a source of great trouble, as they are constantly breaking down under the strain of heavy marching, and they should certainly never be admitted as "Class I".

Another point about which there is a doubt in many minds is whether a man with an ununited fracture of his carpal navicular is fit. Certainly many people with such a disability lead a perfectly normal civil life. But again, experience under army conditions has shown that they cannot stand the strain, as such things as falling flat on the ground during an air raid alarm or in action cause considerable violence to be applied to the wrist.

Osteoarthritis in any joint, even if it is not causing any pain or stiffness at the time, is a great potential source of trouble, and consequently disqualifies a man for full duties.

Reports of Cases.

AN UNUSUAL ACUTE CONDITION OF THE ABDOMEN.

By P. W. GILL,
Sydney Hospital.

Clinical Record.

P.C., a male patient, aged fifty-nine years, was admitted to hospital at midday on Monday, August 25, 1941. He had had severe right-sided abdominal pain for sixty-four hours, since 8 p.m. on Friday, August 22. Morphine had been given several times during the week-end, as he appeared at first to be suffering from renal colic; but on the Monday admission to hospital was considered necessary, as the pain was still present, vomiting was becoming frequent, and it was feared that he might have intestinal obstruction.

In September, 1936, he had had an attack of severe pain in the upper part of the abdomen. An urgent operation was performed, and the only abnormality found, a large oxalate stone, was removed from the left kidney. The wound became infected and a perinephric abscess formed, which was drained in January, 1937. He was in good health during the next four years. On July 4, 1941, he was seated

in a train on his way home from work, and remembered telling a workmate how well he was feeling. A few moments later he was seized with excruciating pain "all over the belly", which made him slide onto the floor. His friends carried him to a car and drove him home, where his wife declared that he looked "like a corpse bathed in perspiration". Renal colic was diagnosed by the local doctor, who knew of his previous operation, and he was given morphine. The pain eased off after about two days, and on July 10 he came to Sydney Hospital as an out-patient for urological investigation. Cystoscopy and retrograde pyelography revealed a normal right kidney with excretion of dye. The left kidney functioned poorly and was rotated so that the pelvis lay laterally. He was advised to have it removed. Meanwhile his health improved and he expected to resume work on August 25, although it seems reasonable to assume, as he was away from work for seven weeks, that this illness had caused a considerable constitutional upset.

On Friday, August 22, the patient spent the evening at home and told his wife that he was feeling "splendid". At 8 p.m., still feeling well, he rose to go to bed and promptly collapsed with pain. As before, the onset was sudden, and he was unable to go to bed without assistance. Pain was present all over the upper part of the abdomen, and radiated to the right loin and renal angle. It was persistent, with occasional exacerbations, and was still present when he was admitted to hospital sixty-four hours later. Vomiting did not occur until some eighteen hours after the onset, but then it became frequent. The bowels had not opened, but were usually regular. There were no urinary symptoms, and he had never suffered from indigestion. The presence of shoulder pain, though the information was not volunteered, was readily admitted when special inquiry was made. It had been felt at the tip of the right shoulder during the Saturday and had since passed off. He did not remember whether it had been present during the previous attack. His appendix had been removed.

On his admission to hospital the patient was dehydrated and looked very ill, with flushed, sunken cheeks and dry, furred tongue. The temperature was 99° F., the pulse rate was 130 per minute and the respirations numbered 24 per minute. On his admission to hospital he vomited some bile-stained, almost odourless fluid. The respiration was entirely thoracic in character. He had three abdominal scars—a McBurney's incision, a lower mid-line incision and a left lumbar incision. The abdomen was moderately distended; pronounced right-sided tenderness and muscle guarding were present, extending round to the renal angle and down to the right iliac fossa. It was maximal just below the right costal margin. No tenderness was present *per rectum*, and the liver dulness appeared to be normal. The abdomen was "silent" on auscultation, but splashing was heard over the right upper quadrant if the patient was shaken gently. The urine contained no abnormal constituents except acetone. The reflexes were normal.

The main points against a right-sided renal lesion were the results of the urine examination and the recent urological findings, and at this stage he was obviously not suffering from renal colic. Intestinal obstruction had to be considered, but seemed improbable for the following reasons: (i) if the block were high up in the small gut, as suggested by the severity of the pain, the delay in the onset of vomiting would be inexplicable; (ii) if it were lower down, one would not expect to find, after two days of vomiting, that the vomitus would be merely bile-stained and odourless. Four points did emerge, however, which were of the greatest diagnostic value: (i) The onset was so sudden and severe that the patient was able to remember the very minute and exactly what he was doing. (ii) The pain rendered a more or less able-bodied man helpless in a moment. (iii) Pain was felt at the tip of the right shoulder. (iv) The abdomen was held immobile and did not rise and fall with respiration. These points, in spite of his recovery from a previous attack and absence of previous dyspepsia, were considered sufficient grounds for a diagnosis of ruptured peptic ulcer, with extension down the right paracolic gutter.

A pint of glucose and saline solution was given intravenously before operation. A right upper paramedian incision revealed a collection of purulent fluid in the paracolic gutter and below the liver. It was walled off from the general peritoneal cavity by fairly firm adhesions. A ruptured ulcer was found in the first part of the duodenum, surrounded by dense fibrin. It was oversewn and the abdomen was closed without drainage. The patient's condition did not permit a detailed examination. However, convalescence was uneventful and he went home on the twenty-fourth day.

Comment.

Spontaneous recovery following natural closure of a ruptured peptic ulcer is occasionally suspected on clinical grounds, but cannot be verified except by operation or autopsy, since one or two other conditions may simulate ruptured ulcer and tend to spontaneous cure. But the patient whose case is reported here had two attacks of pain which were practically identical: the first in a train on July 4, 1941, which rendered him unfit for work for seven weeks; the second at home on August 22, which was shown at operation to be due to a ruptured ulcer. Moreover, spread of duodenal contents was limited on the latter occasion by adhesions, so that the patient recovered in spite of an interval of sixty-six hours before operation. It is believed that perforation occurred on both of these occasions, that natural closure followed the first, and that the resulting adhesions served later as the main line of defence.

Acknowledgement.

I have to thank Dr. R. J. Malcolm for permission to report this case.

Reviews.

A YEAR BOOK ON PUBLIC HEALTH.

"THE 1941 Year Book of Public Health", like its predecessor of 1940, is a valuable and welcome volume.[1] The editor is Dr. J. C. Geiger, who is Director of Public Health of the City and County of San Francisco, and also holds teaching appointments on the staffs of three medical schools. For those who are not used to the "Practical Medicine Series of Year Books", of which this is one, it must be explained that the volume consists of series of abstracts of articles arranged in a logical sequence and in many instances annotated by the editor. The arrangement is a happy one, for the editor is able in his notes to link up recent work with the reports of investigators in previous years. For example, a good deal of space is given to work by Garcia on psittacosis in Buenos Aires. In discussing this article the editor points out that it is assumed that the principal carrier of the virus in the Argentine is the Australian parrakeet. He states that it is premature to draw such conclusions without a detailed investigation of native parrots shortly after they have been caught in the forests, and that in this connexion the "exemplary studies of Burnet in Australia should serve as a guide".

The book is divided into several sections; these are arranged aphabetically. Thus we have successively: administration (medical care); child hygiene; communicable diseases and epidemiology, divided into general, malaria, tuberculosis, poliomyelitis, venereal disease; dental hygiene; food and milk; health education; hospital hygiene; housing; industrial hygiene; laboratory; maternal care; mental hygiene; nursing; nutrition; statistical. Obviously these sections cannot be reviewed in this place; to do justice to such a task would require a whole issue of this journal. Some of the sections may be mentioned. A good deal of space is devoted to venereal diseases, and social hygiene is considered in relation to national defence. In the section on military hygiene we are shown that gonorrhœa was the chief cause of non-effectiveness of the United States Army in 1938. The section on venereal disease also contains discussions on the general practitioner in his relationship to them, an account of premarital examination laws in operation, and, *inter alia*, a résumé of ten years' work by the Los Angeles Maternity Service on pregnancy and syphilis. The section on health education has much that will be of profit to the school medical officer. In this year's volume more space is given to child hygiene than in last year's volume. Then it was divided into four sub-sections: general, dental hygiene, mental hygiene and nursing. The last three now have sections devoted entirely to them, and child hygiene stands alone. With the recognition of child hygiene as one of the most important branches of public health most workers in this branch of medicine will agree. The same can of course be said of mental hygiene. In this connexion it is interesting to note that in 1938 schizophrenia was the principal disability causing discharge from the United States Army. We note that mention is made of the work of Reginald Webster and Douglas Galbraith on the use of microradiography and the detection of pulmonary tuberculosis in recruits.

Enough has been written to show readers what manner of book this is. It is indispensable to those whose interest lies in preventive medicine, and general practitioners will find much in it that will hold their interest. The book should have a large sale.

[1] "The 1941 Year Book of Public Health", by J. C. Geiger, M.D., Dr.P.H.; 1941. Chicago: The Year Book Publishers Incorporated. Crown 8vo, pp. 544, with illustrations and diagrams.

The Medical Journal of Australia

SATURDAY, DECEMBER 20, 1941.

All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

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SOCIAL SECURITY.

THE present war is being fought to secure for the individual freedom of action, of speech and of thought, so that with other free men he may share the privileges and responsibilities of citizenship, and that the citizenship not only of a free nation but of a free world. Most of us have known all along that the war is more than a war of survival, but it is doubtful whether everyone knows what it really means to be a free citizen in a free world. Men speak of freedom of action, of speech and of thought, and these are essential to happiness; but there is another freedom that must be remembered, and that is freedom from fear for the future, freedom from want due to unemployment, sickness or old age. The term social security has been used to cover this desirable state. There are those who declare that the nation should bring all its energies to the winning of the war and leave questions of social security to the post-war period. But if the war has shown nothing else it has shown that in order to survive, a nation must have a soundly based and solidly built social structure. It is therefore not surprising that the present world upheaval has turned men's thoughts as never before to the removal of conditions that hamper the individual and threaten his future welfare if not his very existence. Those who plan for social security while the very world seems to be crumbling round their ears have unanswerable arguments on their side. But the words social security are used by so many in such a glib and light-hearted fashion that we do well to consider what they mean and what we must do as individuals to make social security an accomplished fact.

To some people social security will mean an assured position in society for themselves, adequate provision of food and clothing with shelter not only in the heyday of strength and health, but in times of sickness and in old age. This subjective view is futile and soul destroying. Social security is something which concerns every member of the community. It is not a passive state to be accepted as a right without any deserving. It is an active condition, to be earned, to be sought, for others as much as for self; in this, as in many other things in life, he who does most for others unwittingly does most for himself. But this is to anticipate the end of the argument. The discussion of this subject is opportune by reason of a recent contribution from the pen of Oswald Stein in the September, 1941, issue of *International Labour Review*. Stein is chief of the Social Insurance Section of the International Labour Office which was brought into being many years ago by the League of Nations. The League of Nations has fallen into disrepute, but it has had at least two highly successful spheres of activity. One has been the Health Organization and the other the International Labour Office. Stein begins by stating that but a few years ago social security was little more than a slogan, a bare outline of an idea; today the slogan stands for a wide-visioned constructive programme; tomorrow the programme will have become an accomplished fact "if humanity remains free" and follows the road of progress "The standard of social security will then be the index of industrial civilisation, and indeed of civilisation itself." From the national point of view Stein writes that every country must maintain and increase the moral vigour and physical resistance of the able-bodied members of the population, it must prepare the way for coming generations and take care of those who have been eliminated from productive work. The essence of social security from this point of view is "the genuine and rational economy of man power, yielding the greatest good for the greatest number". The object of social security is well described by Stein in the following words: "to prevent those losses of productive life and capacity that can be avoided; to ensure that each makes the best possible use of his powers and aptitudes; to underwrite equality of opportunity with a real collective guarantee, taking effect in the event of an involuntary failure of individual effort. And, in the attainment of those ends, to accord due respect to the supreme and inalienable values of individual dignity and liberty." This definition may be commended to the thoughtful consideration of readers; it covers the ground and does not waste words. We must insist on a recognition that attempts to gain social security must be based on an intimate knowledge of what Stein so well calls social pathology, on a study of the causes and effects of the common risks of life. When we speak of the common risks of life we imply that these risks are common to all men, as indeed many of them are; but we must recognize that these risks are infinitely greater for those among the low-income groups than among the well-to-do. These risks vary in different countries and vary with age, sex, income, housing, nutrition, employment and health. Surely none will deny that it is the duty of all thinking members of the community to study these factors as they affect organized society and the individual. Medical practitioners have the same duty as other men and women, but their need to study these conditions is particularly clamant;

they can, individually and collectively, do much to hasten the attainment of social security; they and the non-medical members of the community must recognize this, but the powers of medicine in this direction must not be overestimated. There is perhaps a tendency today to expect too much of organized medicine in the social sphere. The medical profession in Australia is trying to find some way in which a general medical service can be established, and, if we can judge from their general attitude, some persons appear to think that when such a service has been established a kind of social millennium will have arrived. Nothing, of course, is further from the truth. The establishment of an adequate medical service for the whole community will help many folk in the struggle of life and relieve their minds of fear in matters of medical care. But as we have seen there are other causes of fear, and organized medicine has a right to insist that some effort shall be made in economic and other spheres to eliminate these, so that what medicine is able to do may have its full effect. Though this is really incidental to the present discussion, it is of the greatest importance just at present when so many are concerned with the future of medical practice. It does, however, indicate that social security is not to be achieved by reforms, however extensive they may be, in any one aspect of social life. To attempt such an impossible task is like plugging one of several holes in the bottom of a leaky boat in the hope that no more water will enter. From what has been written the full implication of the words social security should be clear and there is no need to deal further with the factors of age, sex, income, housing, nutrition and employment; there will be other occasions for such discussions. One of Stein's general conclusions should, however, be stated. He points out that it is no longer disputed that it is not enough to fight the causes of social insecurity. Though vigilant prevention will reduce the frequency and severity of the risks, it cannot eliminate them. "Prevention is indispensible and ever of prime importance, but the irreducible volume of risks that are the outcome of the natural wear-and-tear of the human organism will always necessitate the provision of substantial maintenance benefits."

The duty of individuals in search of social security remains to be considered. We have already described social security as an active state which has to be sought and earned. Stein puts it in another way when he writes that one of the objects of social security is to underwrite equality of opportunity with a real collective guarantee which will take effect in the event of an involuntary failure of individual effort. He also discusses the limitations of social security and reminds us that man will always have to earn his bread in the sweat of his brow. There is no doubt whatever that he is right when he states that it would be wrong to wish to create a society free from individual risk and responsibility. Each man and woman must indeed remain "the master of his fate and bear the consequences of his act and of his omissions". The responsibility of the individual to the State and what he owes to the community are regarded in a very different way today from what they were in our social organization even a decade ago. The war has helped to create a new realization of this debt. We now believe that it is incumbent on every person to make some effort to justify his existence. Saint Paul was a veritable socialist when he wrote to the Thessalonians that if a man did not work he should not eat. In society as we know it there are persons generally at the opposite ends of the social scale who do not work—one group because they will not work though they have need to, and the other group who have no need to work and yet do nothing that is likely to benefit a fellow man. Both are parasites on the social structure and present a real problem. The Thessalonians in apostolic times evidently had this problem and Saint Paul insisted that these drones were not to be counted as enemies, but admonished as brethren. The present-day drones must be tougher than drones used to be, for no amount of admonishing would have much effect on their lethargy and selfishness. Unless society is prepared to allow these drones to continue in their antisocial ways, some form of compulsion will have to be applied to them, and this will be inevitable. Society will always have its hands full enough with the care of those who have made an honest effort and failed and those who because of age or infirmity are incapable of effort. Man's place in society will be made secure only by cooperative effort—"each for all and all for each". The general conclusion has already been stated: that he who does most for others unwittingly does most for himself.

Current Comment.

THE TREATMENT OF EMPYEMA THORACIS.

Most physicians and surgeons base their treatment of *empyema thoracis* on the findings of Graham and Bell, of the Empyema Commission of 1918. There is no doubt as to the importance of that commission's findings, but it is still possible that prior to 1918 or in the twenty-three years which have elapsed since then, a better method of treatment than that of waiting for stability of the mediastinum and thickening of the pus before the institution of open drainage, may have been evolved. Immediate continuous closed drainage is said to constitute such a method. It is, however, not new, for it was introduced by Potain in 1869 and by Hewett in 1876. In the past seventy years this method has been frequently revived, but because of some inherent difficulties in its use it has not enjoyed the popularity it deserves. In children the immediate treatment of *empyema thoracis* is imperative, for the vital capacity is small, the mediastinal structures are very mobile, and thus a moderate-sized, rather rapid collection of fluid in the pleural cavity can seriously embarrass respiration and circulation, and therefore result in considerable dyspnœa and cyanosis. This is only slightly less true for adults. Immediate open drainage, that is, drainage immediately the empyema is diagnosed, is not justifiable in the case of acute streptococcal empyema, for, as Graham and Bell have shown, the mortality rate is prohibitive. If drainage is delayed, pulmonary fibrosis and pleural thickening occur and reexpansion of the lungs is inhibited. Reexpansion may also be inhibited by extensive scarring of the interlobar septum, which is especially common following streptococcal empyema. Many very encouraging reports on the use of immediate closed drainage in all varieties of *empyema thoracis* have appeared in the literature. Patients so treated are less likely to suffer from failure of reexpansion of the lung and its attendant complications, and, what is more important, have an appreciably lower mortality rate. Such a lowered mortality rate is to be expected when the

frequency of the complications following failure of reexpansion of the lung is lessened, for, as most surgeons will agree, in the majority of fatal cases of *empyema thoracis* death is the result of the complications and not of the empyema *per se*.

The excellent results obtained at the Children's Hospital, Melbourne, following the introduction of immediate closed drainage in cases of *empyema thoracis* have been described by E. R. Trethewie.[1] He pointed out the necessity for placing the tube at the centre of the cavity, for with continuous aspiration closure occurs in concentric circles and not from above downwards, as with open drainage. Attempts at intercostal drainage are usually doomed to failure, and while such treatment may tide the patient over the acute stage, more often than not the drainage is poor and a chronic empyema develops. Rib resection is nearly always necessary later. The tube advocated by Trethewie is of large bore and has a dental dam and sponge rubber flange, which, when held against the chest wall by elastic adhesive plaster, allows considerable reduction in pressure in the chest without leakage. Because of the size of the tubing used, because rib regeneration occurs rapidly in children and because it may be necessary later to explore the cavity digitally, he recommends the resection of at least six centimetres of rib, even in the smallest child. During the week after operation the pressure in the chest is gradually reduced. If the reduction in pressure is too rapid, pulmonary œdema may result; in other cases there may be hæmoptysis and severe thoracic pain, and in some reported cases rapid withdrawal of large quantities of fluid has caused death. An important feature of closed drainage is that it does not contraindicate mobility of the patient, for the tube may be temporarily clipped off. As soon as possible the patient is encouraged to sit out of bed. In view of the large amount of pus aspirated from many patients, a diet with a high protein and high vitamin content—a high caloric value—is always essential. The criteria for the removal of the tube are the same as with open drainage. Among thirty-five young children treated by this method Trethewie reported but two deaths. One was apparently due to a delay on the part of the parents in bringing the child to hospital, and in the other case, in addition to the pneumonia, there were pericarditis, pyelitis and *otitis media*, probably the result of inadequate drainage at the first operation, due to malposition of the tube.

Unless division of muscles is inevitable, the surgeon will endeavour to split the muscles in the direction of their fibres, yet in the great majority of cases an *empyema thoracis* is approached through an incision along the intercostal space, which, of course, necessitates division of the fibres of the *latissimus dorsi* muscle. An oblique incision directed downwards and inwards in the direction of the fibres of the *latissimus dorsi* is advised by A. L. D'Abreu,[2] on the ground that when the muscle is split in the direction of its fibres the tendency for suppuration to proceed along muscle planes is lessened. Incidentally, such spread of infection may be inhibited by smearing "Vaseline" in the wound before the pleura is opened. If this is done, it is as well to avoid getting the "Vaseline" on the gloves, otherwise the instruments become very difficult to handle. D'Abreu also points out that other advantages of an oblique incision are, first, that the tube tends to lie more comfortably, as with the incision along the line of the rib the skin opening often does not correspond accurately with the opening made in the pleura after rib resection (this especially applies if the arm is elevated above the shoulder during the operation), and secondly, that if an error in the choice of the rib is made the incision can readily be enlarged. Even the best of surgeons will occasionally find that the incision is placed so low that the ascent of the diaphragm which accompanies evacuation of the pus tends to occlude the drainage tube and it is necessary to resect a higher rib.

[1] *The British Journal of Surgery*, July, 1939, page 58.
[2] *Surgery, Gynecology and Obstetrics*, August, 1939, page 209.

Closed drainage of the pleural cavity has also been advocated for the treatment of conditions other than acute *empyema thoracis*. A considerable lowering of the mortality and morbidity rate from post-operative empyemata followed the introduction of closed drainage in the after-treatment of lobectomy and pneumonectomy, and there is a place for closed drainage in the treatment of chronic *empyema thoracis*. Although possessing peculiar risks of its own, bilateral *empyema thoracis* is probably best treated by bilateral closed drainage. H. Koster, L. P. Kasman and J. Rosenblum[1] observed that when one side only in a case of bilateral *empyema thoracis* was drained by closed suction, this side healed more rapidly than usual, owing, in their opinion, to the compression effect of the contralateral collection of pus. Therefore in unilateral cases of *empyema thoracis* they suggest closed suction drainage of the empyema together with the establishment of a small contralateral artificial pneumothorax. Using this method of treatment, they have reported good results; but further investigation of the extent and the effects of the reduction in the vital capacity that this procedure entails would seem to be indicated before its routine use is advocated.

Soon after the introduction of "Prontosil" to clinical medicine, a few sporadic reports, such as that of J. L. Brown,[2] appeared in the literature dealing with favourable results obtained by the injection of this drug into the pleural cavities of patients suffering from acute *empyema thoracis*; but in the last four years the local application of the sulphonamides in the pleural cavity seems to have been neglected in favour of other routes of administration. This neglect cannot be explained by any appreciable lowering of the mortality rate of this disease brought about by the sulphonamides, for *empyema thoracis* is one of the few pneumococcal and streptococcal diseases which are relatively unaffected by sulphonamide therapy.

Empyema thoracis is a frequent and serious complication of penetrating thoracic wounds. Usually it does not immediately follow the injury, but is often preceded by a hæmothorax, and as R. C. Brock[3] points out, the management of all cases of hæmothorax is important and may present many difficult problems. One of the greatest dangers of a hæmothorax is the onset of infection, which may not occur until as late as ten to twenty days after the receipt of the wound. Presumably the infection occurs from sloughing of devitalized lung tissue in the track of the missile. One of the early signs of infection of a hæmothorax is often a rising pulse rate. The fluid should be examined at least every day, and once infection of the fluid has occurred drainage is needed. Although Brock rightly condemns repeated aspiration of the purulent exudate and intercostal drainage as the sole methods of draining an *empyema thoracis*, and points out that the fundamental principle of civilian surgery still holds good—that is, that in almost every case of *empyema thoracis* the adequate drainage provided by rib resection is essential to allow perfect healing in the shortest time and with the minimum of disability. Brock does not mention closed intercostal drainage and accordingly states that it is important not to drain the pleural cavity too early, for otherwise the lung will remain collapsed down on the hilum or will expand irregularly, shutting off the drainage point and leaving a large residual or imperfectly drained anterior pocket of pus. There is no doubt that such a condition may follow the early open drainage of an infected hæmothorax; but trial of immediate closed drainage with a tube similar to that described by Trethewie would certainly be worth while, for it is to be expected that only rarely, as in the presence of a retained foreign body, would chronicity of the infection develop; whereas in most of such cases it is to be expected that cure of the empyema would be accelerated, a factor obviously of considerable importance in the treatment of the wounded.

[1] *Annals of Surgery*, December, 1937, page 992.
[2] *The British Medical Journal*, Volume I, 1937, page 1157.
[3] *The British Medical Journal*, July 26, 1941, page 128.

Abstracts from Medical Literature.

DERMATOLOGY.

Post-Rhagadic Scars.

E. A. STRAKOSCH AND L. M. NELSON (*Archives of Dermatology and Syphilology*, April, 1941) discuss the pathological changes in syphilitic rhagades of the face. The formation of rhagades is the result of the diffuse syphilitic infiltrative process. The thinness and mobility of the lower lip predispose this area more than other parts of the face. The authors quote Hochsinger, who stated that the diagnosis of congenital syphilis can be made only when the following three distinguishing features are present: (*a*) diminution of the red colour of the lip and of the distinctiveness of the muco-cutaneous border; (*b*) multiple sagittally arranged, deep, scarred furrows beginning at the muco-cutaneous junction and extending back over the carmine portion of the lip (the favourite sites of these furrows are near the angles of the mouth on the lower lip and near the philtrum on the upper lip); and (*c*) extension radically of the previously described scars into the skin of the lip. The apparent scar is histologically an atrophic area of elastic fibres rather than a true scar. In the involved areas it has been reported that elastic fibres are destroyed and that this leads to a depression of the epidermis which has lost its support. The collagen is normal and the epithelium in places is hypertrophic rather than atrophic. The authors report three cases of post-rhagadic scars of congenital syphilis and one case in which lesions were present in a non-syphilitic patient. In the latter case scars were present at the angles of the mouth, but did not involve the lips, and the muco-cutaneous borders were distinct. The direction of the scars was downward and outwards, in contrast to the course of furrows caused by a syphilitic papule, which extends upward and outward.

Diaper Dermatitis.

C. J. DRUECK (*The Urologic and Cutaneous Review*, July, 1941) discusses the symptoms and treatment of diaper dermatitis. The lesions are limited to the diaper region. The lesions are rounded or oval papules of a red or bluish colour, the surfaces of which may be smooth but may be eroded; they are confined to the convex surfaces of the diaper region. Severe ulcerations may occur in neglected cases with deep punched-out ulcers. The diapers of babies suffering from napkin dermatitis will always be found to emit the odour of ammonia. Liberation of this ammonia by alkali in the diaper is assumed to result either from soap left after washing or from alkaline stools. Ammonia is formed in the wet diaper *in situ* by the growth of a saphrophytic bacillus which splits the urinary urea into ammonia. Another factor of importance is the diet. Many infants with ammoniacal diapers are fed on formulæ relatively high in fat. The author suggests that the reaction of the intestinal contents influences the number of urea-splitting bacilli in the stools. The best treatment is prophylactic; so treat the diaper, not the child. Keep napkins fresh and clean and frequently changed. They should be washed with scrupulous cleanliness, rinsed thoroughly several times in clear water and put through a final rinsing of boric acid solution. Avoid soap and water on the affected parts, which should be cleansed with olive oil or liquid paraffin. A soothing lotion or ointment should be used.

Acute and Subacute Disseminated Lupus Erythematosus: Treatment with Liver Extract.

THEODORE CORNBLEET (*Archives of Dermatology and Syphilology*, May, 1941) reports the results of the trial administration of liver extract in combating the toxic states of *lupus disseminatus*. The condition of three patients with acute and subacute forms of disseminated *lupus erythematosus* was favourably influenced by the injection of two cubic centimetres of liver extract given daily or three times a week. Eleven patients with cutaneous lesions which were diagnosed as those of chronic discoid *lupus erythematosus* were given injections of two cubic centimetres of liver extract three times a week. The treatment in each case was carried out over periods varying from three weeks to four months in duration. There appeared to be some improvement in three cases in which the lesions were followed by recrudescence. In the other cases the lesions either did not improve at all or extended. The author remarks that when liver extract is helpful in the acute disseminated cases it apparently does not remove the underlying cause.

Pemphigus Solitarius Cicatrisans.

T. DAVIES (*The British Journal of Dermatology and Syphilis*, June, 1941) describes the condition of *pemphigus solitarius cicatrisans* and appends seven case histories. The complaint is of bullæ occurring, usually singly, at intervals varying between two days and two years. The bulla, which is often preceded by an erythematous nodule or ring, is thick-walled and may last several days without the contents becoming turbid. It is succeeded by an ulcer having thickened torpid edges, taking many weeks to heal, and invariably leaving a scar. The lesions occur on skin which is otherwise normal. They are mostly found on the hands and wrists, but may also occur on parts covered by clothing and on other parts relatively inaccessible to the patient's hands or to sources of accidental trauma. The author discusses the differential diagnosis.

Neurodermatitis Associated with Incompetent Greater Saphenous Veins.

W. W. HEYERDALE AND E. E. CANNON (*Archives of Dermatology and Syphilology*, July, 1941) report a case of neurodermatitis associated with incompetence of the saphenous veins. The authors state that it is generally recognized that patients who have varicose veins often have associated dermatological complications, the lesions being stasis, dermatitis and ulceration of the skin. However, it is probable that a number of patients who have neurodermatitis of the legs do not always receive the benefit of consideration of the factor of venous incompetence. Among some persons the incompetent saphenous veins may lie deep in the superficial fat, and both patient and physician may be unaware of their presence if a thorough examination is not made. In the authors' case the patient had been treated without relief for ten years. Casual inspection revealed no varicose veins, but moderately dilated veins were palpable deep in the fat of both thighs and legs. The palpation-percussion test revealed that the veins draining the regions affected by neurodermatitis were tributaries of the greater saphenous veins. Both greater saphenous veins and their tributaries were ligated and divided, and three cubic centimetres of a 5% solution of sodium morrhuate were injected into the distal segment of each vein. By the fourth post-operative day paling of the dermatitis was evident and itching had been alleviated. By the tenth day itching was absent and application of ointment unnecessary. Except for moderate residual thickening and slight discoloration, the skin appeared normal.

Topical Treatment with Sulphathiazole.

W. M. SAMS AND L. CAPLAND (*Archives of Dermatology and Syphilology*, August, 1941) treated 53 patients suffering from various cutaneous infections, chiefly impetigo and ecthyma, with sulphathiazole, both as a powder and in an ointment. The drug in an ointment varied in concentration from 5% to 25%, and was incorporated in various types of pastes and ointments to suit the presenting dermatitis. Treatment was initiated by removal of crusts and opening of the blisters. Sulphathiazole powder was blown on the moist surfaces and the patient was told to remove twice daily the crust that would form. This was done by the application of the prescribed ointment, containing from 10% to 20% sulphathiazole, to the crust for several hours. When soft, the crust was removed by soap and water and the powder was again used. Thirty-three patients with impetigo, varying in duration from two to twenty-one days, were observed or reported to be well in from four to ten days (average one week). Twelve patients with ecthyma, varying in duration from two weeks to twelve months, were clear of secondary infection within one week. Additional time, however, was required for complete healing. The remaining patients with secondarily infected dermatitis gave an immediate response so far as secondary infection was concerned, but without much change occurring in the underlying dermatitis. The authors as yet have not observed any deleterious effects on the skin from the local application of sulphathiazole, nor were any systemic effects noted.

UROLOGY.

Calyceal Diverticulum.

G. C. PRATHER (*The Journal of Urology*, January, 1941) describes under this name cases in which a cyst is formed distal to a calyx and directly connected to it by a fine epithelialized channel. The surface of the kidney shows the protuberance of the cyst, which may be treated by excision or nephrostomy and dilatation of the communicating channel when the cavity is too large to be conveniently approximated. The author's patients all had comparatively brief histories of renal pain; stones were present in the diverticulum in two cases; none of the diverticula were infected and in each case the diverticulum filled well with the opaque medium in excretion urography, and this persisted long after the kidney had emptied. The same condition has been described under several

names: "urinary cyst", "partial hydronephrosis", "pyelogenic cyst" and "hydrocalycosis". The author suggests that calyceal diverticulum is a better descriptive term.

Torsion of the Testicle.

J. C. KIMBOROUGH (*The Urologic and Cutaneous Review*, June, 1941) reviews the ætiology, diagnosis and treatment of torsion of the testicle. There are only two essential ætiological factors, namely, (*a*) inadequate attachment of the *tunica vaginalis*, testicle and epididymis; and (*b*) action of the cremaster muscle. The position of the epididymis is a definite aid in diagnostic palpation. Careful and systematic palpation of the scrotal contents in all painful conditions in this region will disclose a commoner incidence of torsion. The treatment is immediate open operation and detorsion of the testicle, with application of heat. If the testicle does not present evidence of returning to its normal colour, orchidectomy is performed at once.

Neurogenic Bladder in Diabetes.

A. RUDY AND S. R. MUELLNER (*The Journal of Urology*, June, 1941) discuss a number of cases of *diabetes mellitus* with "neurogenic" bladders. In every case there was other evidence of peripheral neuritis. The authors have found that administration of vitamin *B* complex, and especially of thiamin hydrochloride, is of great assistance. Where the urine is not infected, the bladder should not be catheterized, in spite of a large amount of residual urine. Vitamin *B* is given in large doses over a long period. Pressure and the erect posture for micturition enable the patient to evacuate most of the urine. The amount of residual urine may be estimated periodically by the taking of a radiogram after micturition during excretion urography. During this stage diabetes is controlled by estimation of the blood sugar, and the diet must be adequate and especially rich in vitamins and minerals. If the urine is infected, continuous catheter drainage with intermittent lavage is practised in addition to the above measures.

Rupture of the Urethra.

C. A. WELLS (*The British Journal of Urology*, March, 1941) states that the direct and indirect violence of war is causing an increase in numbers of urethral ruptures. He is especially concerned here with the cases complicating old fractures of the pelvis. The prostate is carried upwards and becomes fixed. The fractured *symphysis pubis* is filled with a block of hard tissue, and the marooned anterior portion of the urethra is separated from the bladder by some inches soon after the accident. Suprapubic drainage should be established and secondary repair of the urethra must be attempted at some period later on. Even when the anterior portion of the urethra is mobilized by being well dissected up, it may not be possible to bring it into contact with any remaining portion of the posterior portion of the urethra or the bladder neck. The author has devised a very simple means of overcoming this grave difficulty. While dissecting up the anterior portion of the urethra the surgeon is careful not to cut across the blind end of the urethra. This canal is slit in a longitudinal coronal plane in such a manner that a flap about one and a half inches long is made from its floor. When this flap is turned back it adds its length to the roof of the canal. A gutter is carved in the dense scar tissue which lies between the fractured pubic elements. The end of the dissected urethra is now picked up with a catgut suture; the latter is drawn into the bladder and out through the suprapubic fistula, where it is attached to a rubber band, which keeps it in place with light tension, the rubber band itself being stitched to the skin near one antero-superior iliac spine. The suprapubic drainage is continued and a small rubber catheter lies in the urethra as a splint. By the time the catgut tension suture cuts through, the urethra has grown to its new bed.

Treatment of Epididymitis.

D. R. SMITH (*The Journal of Urology*, July, 1941) describes the treatment of twelve patients suffering from acute infective epididymitis by infiltration with local anæsthetic. In one case the treatment was a total failure, but in the remainder it was quite successful. The technique is as follows. Ten to twenty cubic centimetres of 1% "Procaine" are used for subcutaneous infiltration of the spermatic cord in its entire thickness. In a few seconds subjective numbness occurs. After one or two hours anæsthesia disappears, but in the most favourable cases pain and tenderness do not recur. In others mild discomfort recurs temporarily. If pain is still present in twenty-four hours the region should be reinjected. It is claimed that resolution is expedited wtihout the usual supportive measures.

MEDICINE.

Acute Silicosis.

W. D. MCNALLY (*The Journal of Industrial Hygiene and Toxicology*, January, 1941) reports the history of a young man, working as a sandblaster, who developed silicosis within a period of eleven months. The disease was in an advanced stage within three years. The author states that the "general opinion" that rapidly developing silicosis occurs only in the soap abrasive industry is a fallacy.

Hydrothorax and Heart Failure.

D. EVAN BEDFORD AND J. L. LOVIBOND (*The British Heart Journal*, April, 1941) discuss the old and recent views of hydrothorax in heart failure, and report the result of an analysis of the incidence and distribution of hydrothorax in 356 cases of congestive failure (including left heart failure) encountered in hospital and private practice, and also of an additional 109 cases in which death occurred from heart failure. Hydrothorax was observed at some stage in 136 (38·5%) of 356 cases of congestive heart failure, diagnosis being mostly radiological, and in 45 (41·3%) of 109 cases of failure examined *post mortem*. The hydrothorax was right-sided in 68 cases, left-sided in 42, and bilateral in 26; this included 11 interlobar effusions. The authors found a definite relation between the site of the hydrothorax and the underlying heart condition. Hypertension, left heart failure, and normal rhythm favoured a left hydrothorax, whereas mitral stenosis, combined right and left heart faiure and auricular fibrillation favoured a right hydrothorax. The authors state that clinical hydrothorax, which clears up rapidly with treatment, can rarely be attributed to pulmonary infarction, but that in the terminal stages of heart failure and at post-mortem examination infarction is often an associated condition. Hydrothorax was found to be not uncommon in left heart failure, when it is a complication of pulmonary congestion; this explains its occurrence without œdema. In pure right heart failure ascites without hydrothorax may show some degree of inflammatory reaction, probably due to its contact with chronically congested lungs; no sharp division between transudate and exudate (cardiac pleurisy) can usually be made. Hydrothorax was often found to clear up completely within a few weeks or months in response to treatment by mercurial diuretics, but occasionally it becomes chronic and persists for a year or longer. The authors discuss pathogenesis of hydrothorax and give reasons for regarding it as related to pulmonary rather than systemic venous engorgement, and as a transudate from the visceral rather than from the parietal pleura.

The Intravenous Use of Sodium Sulphapyridine in Pneumonia.

C. W. STRICKLER, A. P. MCGINTY AND J. B. PESCHAU (*Annals of Internal Medicine*, March, 1941) state that it is safe to give sodium sulphapyridine intravenously in lobar pneumonia and that this method of administration usually produces a higher concentration of the drug in the blood than oral administration. But unusually high concentrations seem no more effective than those of 0·003% to 0·004%, there is no greater constancy of the amount of free sulphapyridine in the blood after intravenous injection, the mortality rate is not reduced, and complications and toxic effects are not less frequent.

Bacillary Dysentery and Sulphapyridine.

G. J. BELL (*The Lancet*, July 26, 1941) reports the results of investigations carried out during an epidemic of dysentery due to *Bacillus dysenteriæ* Flexner W and *Bacillus dysenteriæ* Sonne. Sixteen patients were treated with 0·5 gramme of "M & B 693" every four hours until 5·0 grammes were given. Two were not given any "M & B 693". In all treated cases all symptoms had cleared up in thirty-six to seventy-two hours. The effect on the pyrexia was immediate, the temperature being normal in twenty-four to forty-eight hours. After this time repeated bacteriological examinations of bowel material failed to reveal the presence of the dysentery bacillus. The illness of the two untreated patients followed a different course. One patient died within five days and the other recovered after an illness of nearly two weeks.

Prophylaxis of Pneumonia in Old Age.

P. KAUFMAN (*Archives of Internal Medicine*, February, 1941) during a period of two years inoculated 1,750 elderly inmates of an institution with pneumococcal capsular polysaccharide for the prophylaxis of pneumonia. Of these 1,750 persons, 23 developed pneumonia within a year; but in a control group of 1,870 persons who did not receive the inoculation, 104 developed pneumonia. There was no appreciable difference in the case mortality between the two groups, and the course of the disease when it developed did not seem to be influenced by the inoculation. The prophylactic value of the inoculation seemed greater in the first three-quarters than in the last quarter of the year after the injection.

Public Health.

AN OUTLINE OF A POSSIBLE SCHEME FOR A SALARIED MEDICAL SERVICE.

THE following "outline of a possible scheme for a salaried medical service", drawn up by a committee of the National Health and Medical Research Council and submitted to it as a report, has been adopted by the Council.

1. This Council, having perused an outline of a possible scheme for a salaried medical service, which has been submitted to it by a subcommittee of the Council, is of the opinion:

(*a*) that the present system of providing medical care to the public is capable of considerable improvement in some directions;
(*b*) that such measures might involve the provision of a general medical scheme for all Australia, available at will to all persons resident in Australia;
(*c*) that the scheme outlined provides a basis for discussion with representative members of the practising medical profession in Australia; and that such discussion is essential for the correlation of differing but sincerely held points of view.

2. The Council further notes that the scheme outlined aims to improve existing medical facilities:

(*a*) by providing medical care to outpost and remote areas which at present, for economic reasons, cannot support a medical practitioner;
(*b*) by coordinating medical care for the benefit of the patient on the basis of more effective team work, while safeguarding, generally, free choice of doctor, thus minimizing the overlapping due to professional competition, and pooling professional knowledge;
(*c*) by returning general practice (especially out-patient work) to the general practitioner as far as is possible;
(*d*) by making as widely accessible as possible all specialist, consultant and ancillary services;
(*e*) by providing for better distribution of medical men in terms of medical needs;
(*f*) by providing better and more complete records of disease incidence and ætiology and thus better facilities for productive research;
(*g*) by ensuring to medical practitioners adequate remuneration for their services; reasonable opportunities for the maintenance and improvement of the standards of medical knowledge; and relief from the present handicap of their "24 hours-a-day accessibility";
(*h*) by coordinating the health services of a protective nature with the corrective provision for medical care; and
(*j*) by providing a scheme for development, design, construction and administration of all forms of hospital and institutional services incidental to the foregoing.

3. The Council, while approving in principle the practical details and financial items of the scheme outlined, desires to state that it is of the opinion that these, although expressed in detailed form for purposes of discussion, are necessarily tentative. This is particularly the case in respect of the district centres (Class D centres), and, more especially, in connexion with consultation centres in capital cities, where a complete revision of the scheme, in consultation with the medical profession, is essential. Notwithstanding this, however, it is not considered that such revision will materially alter the estimated expenditure.

Subject to the foregoing considerations, the Council believes that a salaried scheme along these general lines is practicable, and should receive serious consideration.

RECOMMENDATIONS OF THE NATIONAL HEALTH AND MEDICAL RESEARCH COUNCIL ON THE FINANCIAL ASPECTS OF A SCHEME FOR SOCIAL RECONSTRUCTION IN RESPECT OF HEALTH AND MEDICAL SERVICES.

In its Eleventh Report the National Health and Medical Research Council outlined its views as to the means by which there might be established a higher state of personal health throughout the whole Australian community by the application of the power and resources of both the Commonwealth and the States, and included among its resolutions the following:

> This Council believes that the situation thus indicated is well worthy of deliberate examination. This Council is prepared, provided the above principles are accepted, to furnish practical details and to support these with financial evidence as to revenue and expenditure.

It was inevitable that this statement should attract attention, and the Parliamentary Select Committee on Social Security which was appointed to "inquire into and from time to time report upon ways and means of improving social and living conditions in Australia and of rectifying anomalies in existing legislation" has asked the Federal Minister for Health and Social Services whether it would be possible for this Council to give some indication of the general lines along which such a change should proceed and the general financial implications involved.

Notwithstanding the reservation specifically made by the Council in the clause quoted, namely, "Provided the above principles are accepted", it is recognized that governments could not adopt the principles advanced until at least some general estimates of the financial changes and commitments involved had been supplied.

This Council therefore has prepared this outline (which it does not suggest is a final and complete scheme) as a basis for the discussion of a reconstructed relationship between the Government, the people, and the medical profession. It seeks to indicate the practical considerations involved in:

(*a*) making health and medical services available to all the people by means of salaried medical officers rather than, as at present, by private practitioners;
(*b*) regulating the distribution of medical men and medical practice as much as possible by basing these activities on existing hospitals and clinics throughout the country; and by providing these where they are lacking; and in
(*c*) bringing the preventive (public health) and the curative (private and hospital practice) services into an organic union; and in this regard giving especial attention to—
  (i) safeguarding childhood as the only permanent national asset; and
  (ii) providing a greater amount of skilled attention for workers in industry, including the workers in the most numerous of female occupations, *i.e.*, the wives and mothers of families.

Part I: Preliminary Note.

Before proceeding to state and to examine in detail the provision considered desirable, this Council wishes to express its considered opinion that, upon all the points raised in this outline, there should be detailed, deliberate and full consultation with the medical profession.

In this connexion it is pointed out that a great many medical men are overseas with the Australian Imperial Forces. It is essential that their interests be fully considered and conserved.

The scheme is tentative and readily susceptible of informed criticism and amendment. It is in some respects subject to existing legislation. It is obvious also that it requires some modification of the *Commonwealth of Australia Constitution Act* of 1901.

At the outset, for example, reference should be made again to the Eleventh Report of this Council, where it is made clear that the Council was and is faced with the fact that a *National Health and Pensions Insurance Act* has actually been passed by the Parliament of the Commonwealth, although it has not as yet been brought into operation, and that, thereby, the Commonwealth Government is at present committed to a social reform which, if introduced, will change the status of a great majority of the members of the medical profession immediately and fundamentally.

The scheme proposed by that Act, however, is so incomplete in range and objective that a very heavy financial commitment would be required to institute what, over a large part of Australia, would be a duplication of existing private practice services, uneconomic to the point of extravagance, if not, in fact, impracticable.

Moreover, in respect of the *per capita* payments on a panel basis contemplated by that Act, the Council has in its Eleventh Report (sections 28 to 31 inclusive) indicated that there are real objections to this method of financing a medical scheme.

The alternatives to such payments appear to be:

(*a*) an individual fee for every individual service rendered; or
(*b*) an annual inclusive payment to cover all services; or
(*c*) the establishment of a full-time salaried service.

It will be observed that this Council assumes the adoption of the last mentioned. It considers the first impracticable. As between (*b*) and (*c*), there is no doubt that a salaried service would be notably easier to administer than a service where individual annual payments would need to be determined for each officer or group of officers by a complicated system of case records and book-keeping.

This Council does not offer any suggestion as to the manner in which the service recommended should be paid for by the public, though it recognizes that some form of direct or indirect taxation appears inevitable. It considers it essential, however, that, whatever scheme be ultimately adopted, it should be one freely available to all the people of the Commonwealth. Every person, whatever his income or position, should have free right of access to such a national service. It is, of course, inevitable that the fundamental human impulse towards individual freedom of action will urge many persons to continue to consult private medical practitioners and to pay the usual fees instead of using the facilities proffered by the national service. This will not affect the efficiency of the scheme as a whole.

As the Council said in Resolution 19 of its Eleventh Report: "these proposals are not inconsistent with the retention of private medical practice and private hospitals".

All calculations in this outline have accordingly been made upon a national basis, and it is important to remember that point in discussion of its details. Moreover, this Council has set itself out to remedy, in this outline, two fundamental defects in the *National Health and Pensions Insurance Act* as it now stands in the Statute Book. These are mentioned as paragraphs (2) and (3) of Section 29, as follow:

> (2) This Act does not provide for the integral relationship between clinical treatment, hospital services and health services which the Council regards as indispensable to any scheme which has the twofold objective of preservation of health and treatment of disease;
>
> (3) It does not provide for any form of domiciliary advice and assistance auxiliary to the general practitioner service provided by the doctor, which, if provided, would very greatly enhance the value of such a scheme as a health measure.

Part II: Existing Agencies.

It is assumed that existing agencies for health and medical services, both in respect of personnel, buildings and equipment, will be available to a very large extent for incorporation in the scheme. This applies, for example, to all existing public hospitals.

In the figures that follow, it has been assumed that the present hospital costs (both capital costs and maintenance costs) may be accepted as established figures for the purpose of this scheme. The same applies to services for mental hygiene. The examination of any alternative basis would extend far beyond the limits of present possibilities.

In the statement of comparative expenses, therefore, identical figures for some items appear on both sides. The question of part-time or honorary practice is, however, one that must be considered, and reference is made to this question later.

It may be expected that any nation-wide scheme will affect the relation of the public to private hospitals, almost as much as it will affect their relationships with private practitioners. Some of the larger private hospitals are already subsidized by the Government. Many of the smaller private hospitals, particularly in country towns, may be of value to the scheme. The total figure in this regard can be estimated only by the deliberate investigation in detail of conditions existing, town by town, in each State—a matter impossible except as an item in the administrative application of the scheme, if approved.

With respect to expenditure by departments of health and expenditure on the medical services provided to the Education Departments where these are separate services, it will be observed that, since they are incorporated in the outline, they appear only in one column.[1] Nevertheless, to correlate preventive and curative medicine, and to extend necessary preventive activities, an initial increase of expenditure is inevitable. It is hoped that this will result, after a short initial period, in a diminution of hospital, and, especially, out-patient costs.

[1] Note.—So far as the actual figures are concerned, the total should be modified by the fact that the present expenditures by the States would not be wholly transferred, and, moreover, certain items of expenditure by the Commonwealth Department of Health would continue—for example, the Northern Territory Medical Service; the Commonwealth Serum Laboratories; the School of Public Health and Tropical Medicine, Sydney; the X-ray and Radium Laboratory, Melbourne; and the Institute of Anatomy, Canberra. The expenditure of the Commonwealth Department of Health also includes expenditure on hospitals. The figures, nevertheless, are sufficiently accurate to have a real indicative value.

Several items of importance omitted from this outline require consideration in any final draft. They include, *inter alia*:

(*a*) the effect of the scheme upon the business of the pharmaceutical chemist;
(*b*) the matter of dental and optical provision in so far as that goes beyond the School Health Services; and
(*c*) the provision of additional institutional accommodation for convalescents, tuberculosis patients and suspects, and similar institutions.

The utilization of the services of medical practitioners at present in private practice is discussed throughout the whole scheme from place to place, particularly in Parts III and IV. The scheme should be open to every registered medical practitioner who is willing to associate himself with it. It should not, however, be compulsory. It is considered that its provisions will be sufficiently attractive to result in a very great proportion of medical practitioners accepting appointment willingly within its range.

Part III: The Basis of the Scheme.

The Eleventh Report of the Council has stated the basis of this scheme in its various resolutions, as follows:

> 10. The whole populated area of the Commonwealth should be divided into Health Districts which should also be Hospital Districts as far as possible.
>
> 11. A District Health Officer should be appointed to each (or to two or more combined) Health District. This District Health Officer should be an officer of the Central Health Department of the State and should—
>
> (*a*) supervise all health legislation in his district;
> (*b*) act as regional medical officer in supervising Commonwealth pensions work;
> (*c*) maintain cooperative association with hospital services;
> (*d*) supervise ante-natal clinics, baby health centres, school medical services, and any similar health services in his district (with necessary medical staff);
> (*e*) control a system of female health visitors;
> (*f*) supervise industrial hygiene services in his district;
> (*g*) act as a coordinating link with physical education activities, pre-school institutes and other related work not under any departmental control.
>
> 14. The responsibility for all routine sanitation must be effectively imposed upon local authorities and not be attempted as a routine function of the Central Health Department, which should be retained as a supervisory authority and increasingly organized so as to be able to develop the more medical side of health work.
>
> 15. The hospital services throughout the populated area of the Commonwealth should be arranged on a District Hospital system (which might in suitable districts include a Base Hospital with subsidiary hospitals). In the metropolitan areas, and in a few of the larger cities, there should be in addition to the Central Hospitals a ring of suburban consultation centres for primary consultations and casualty treatment, and a ring of small hospitals for minor cases. These local centres and hospitals would be staffed by local medical men and would relieve the central hospitals, which should be kept for serious and specialist cases. In the country district hospitals there should be facilities for diagnosis and advice in respect of clinical public health necessities and accommodation for the District Health Officer. This system should do much to relieve the present serious and increasing pressure on the out-patient services of the existing public hospitals.
>
> 16. With respect to the specific problem of sparsely settled districts, this Council recommends that these be provided for by a whole-time salaried service of young medical practitioners on short-term services—with adequate transport facilities.
>
> 18. This Council sees no insuperable difficulty in complete control by the Commonwealth, even including the transfer of State Health Departments, and, in fact, recommends as an ultimate objective such control or transfer with all aspects of preventive and curative medicine, including hospitals.

For the purpose of this outline emphasis should be laid upon certain items. It has already been pointed out, as an assumption, that existing public hospitals will be available

for incorporation in the scheme at their present rate of capital and maintenance expenditure. These hospitals will be grouped in relation to base hospitals and will be reinforced by consultation centres, which will take over from them and return to the general practitioner that large mass of general practice now dealt with at the hospitals as "out-patient" practice. It is more particularly with the latter as an extension of existing facilities that this report concerns itself.

Since it is recommended that the public hospitals should be kept so far as is possible for serious and specialist cases, and that this should be entirely the case with central hospitals, the basic idea of the consultation centre is that every sick person, who is reasonably mobile and who does not need treatment at hospital, should be treated at the consultation centre instead of at his home.

A certain amount of domiciliary visiting, however, will be necessary for persons who do not need in-patient treatment but are unable to attend at the consultation centre.

Above all, the system is based almost entirely upon "group practice", with specialist facilities for cases needing these. These specialist facilities will be available to general practitioners on an almost universal basis.

With this statement of the general principles of the outline its major features might now be indicated.

Part IV: Medical Practitioners.

The outline assumes that, so far as is practicable, the 24-hour per day demand upon the doctor will cease. In one-man centres (that is, A Class Centres)[1] it will not be possible to avoid night calls, but a form of recompense to the doctor for this extra service will need to be devised. It has been provided in the estimates of cost by an allowance.

The doctors stationed at these one-man centres should have opportunities for acquiring higher status and all should, by transfer to other centres or absorption into higher posts, leave these isolated practices after a reasonably short tour of duty.

That brief statement illustrates the position generally with regard to all the doctors in the service contemplated in this outline.

Every doctor after graduation should be required to do one year as junior and one year either as a senior hospital resident, or in association with a consultation centre in the city—in either case special attention should be paid to experience in obstetrics.

At the end of this second year he should be posted as junior general practitioner with the liability to go to an A class or a B class centre[1] if he is sent.

He should soon qualify for promotion to the grade of senior general practitioner when a vacancy occurs. Promotion to senior general practitioner should depend upon proven personal quality and professional ability.

At this stage also should begin the allocation to junior posts of suitable men for special training, for example, public health, pathology, radiology and other special subjects.

The next stage should be the acquisition of membership, fellowship, degrees or diplomas, for which facilities should be made available to officers who had proven themselves qualified for such consideration.

The later senior stages would be determined on recognized principles of promotion.

Each doctor of every grade would be entitled to:

- Annual leave;
- Sick leave on a credit basis according to length of service;
- Study leave if the privilege were granted;
- Superannuation, with compulsory retirement at sixty-five years.

For these conditions of service it would be necessary for the service to be a departmental service under the *Public Service Act*—this would give two valuable additional rights:

(*a*) The right of collective approach to an impartial judicial tribunal—the Public Service Arbitrator—in respect of all questions of salary and conditions of service;

(*b*) The right of any individual doctor to appeal against the promotion of any other doctor.

With respect to (*a*) and (*b*), a special board consisting entirely of medical men should exist to assist the Arbitrator or to hear appeals.

A less rigid constitution, such as that of the Council for Scientific and Industrial Research, presents some advantages, but does not permit of the collective approach or appeals which are available under the *Public Service Act*.

[1] See Part V.

An essential principle in this outline is that the doctor's home is not his professional centre and no consultation takes place there—it remains as his private home.

The grading of the medical service might be:

Hospital residents—	
Junior, with board and lodging	£150
Senior—	
At hospital with board and lodging	£300
At consultation centre	£400
General practitioner—	
Junior, with £104 allowance in certain districts	£700- £900
Senior	£1,100-£1,600
In certain remote districts special district allowance should be provided.	
Junior in training for special practice	£900-£1,000
Responsible specialist—	
Junior	£1,100-£1,400
Senior	£1,500-£1,800
Consultant specialist	£1,800-£2,000
Administration chief	£1,750-£2,250
Advancement of salary should in all cases be by annual increments of £50.	

It may be assumed that those doctors who intend to leave the service to begin private practice would generally do so at the "senior general practitioner" or "junior responsible specialist" stage.

Leave should be on the basis of twenty-one days *per annum*. Class A and Class B should have four weeks, one week of which the doctor should be obliged to give to hospital work, either at the nearest D, E, or F type hospital, or in the capital city. All other grades should have twenty-one days *per annum*.

Every five years each doctor up to senior general practitioner or junior responsible specialist stage should be given three months' study leave, which he would be required to devote to a special course of post-graduate study.

Every doctor in A class and B class centres would be required to attend night calls throughout the year. This could be compensated for—one suggestion is that these might be compounded by an annual allowance of £104 on the basis of two calls per week at £1 per call.

In all other classes night call duty should be taken in rotation and would be equitably met by one full afternoon off duty for each night when a call was actually made.

Every second year selected responsible specialists or consultant specialists in each specialty should be sent to Europe or America to learn latest developments and should spend the year following their return in visiting all the States and transmitting this knowledge to others.

Officers in Classes A and B, and some officers in Class C, should be provided with houses and simple furniture for which they would be charged rental. Officers in other classes would provide their own.

Officers in all classes who need cars might have the purchase price advanced and this be repaid to the department in mileage at 4d. per mile—this arrangement makes the car available for private use without complications.

In the metropolitan centres the senior staff provided in this outline would provide the visiting staff at the hospitals, replacing the present honorary system—but the adoption of this principle would not necessarily mean the exclusion of private consultant practitioners, who could be suitably paid for the service.

In all the D class centres at extra-metropolitan towns the hospitals would similarly be staffed by the senior staff of the district.

One question which would have to be separately decided for each district is whether the senior general practitioner would act as hospital superintendent or whether a separate superintendent should be appointed of the senior general practitioner grade. It is not anticipated that the decision would materially affect the total estimates given in this outline.

University medical schools would be staffed by the universities as at present—these might either be officers of the service seconded for the purpose or private consultant practitioners. This statement includes also the teaching hospitals.

Part V: Distribution of Consultation Centres.

It will be obvious that the consultation centres indicated in Resolutions 15 and 16 of this Council's Eleventh Report must be adapted to meet a variety of conditions. They will differ in classification according to their size and functions.

For a clear picture of the grouping, the towns of the Commonwealth may be grouped according to population or

according to the daily in-patient average. For convenience, six classes have been adopted:

Towns with no hospitals.
Towns with a hospital having a daily average of less than 40 in-patients.
Towns with a hospital having a daily average of from 40 to 50 in-patients.
Towns with a hospital having a daily average of from 50 to 100 in-patients.
Towns with a hospital having a daily average of from 100 to 200 in-patients.
Towns with a hospital having a daily average of from 200 to 400 in-patients.

As this outline develops, it will be seen that four types of consultation centres will provide all the requirements of an efficient national medical service.

These four types are:

A Class Centres: places having a doctor but no hospital.
B Class Centres: places having a hospital with a daily average of less than 40 in-patients.
C Class Centres: places having hospitals with a daily average of from 40 to 50 in-patients.
D Class Centres: places having hospitals with a daily average of more than 50 in-patients and which are selected for district centres.

The detailed description of activities at consultation centres of the four types will now be set out, with the method for the distribution of medical personnel in relation to the centres, together with costs, and some discussion of special considerations and special grouping in certain localities.

In some towns it may not be necessary to build consultation centres, but at this stage the only possible method is to estimate upon the assumption that full building costs will be involved at every place.

In an examination of the conditions existing in any centre of population it will be obvious that the method of classification which has been adopted will not apply invariably. Some centres of population with a small hospital in-patient average serve very much larger populations scattered over a wide area than other towns with similar hospital average. On the other hand, there are certain areas, particularly mining or manufacturing districts or areas, where smaller populations may require a centre of a class higher than their nominal status. Areas of fluctuating population, such as holiday resorts, may require supplementary staff for the periods concerned.

These sources of error are recognized, but in such an estimate as this known numerical quantities, such as in-patient average, population *et cetera*, must be used.

It is probable that no significant error in estimates will occur by using this basis.

A Class Centres.

As mentioned above, the A class centre is provided for towns without a hospital. It would be staffed by one medical officer without the right of private practice, and subject to the control of the district medical officer. The district consultation service would be available to patients on the application of the medical officer. Such additional preventive provisions as could be supplied by the school health service, the dental, optical and other travelling services, would work in cooperation with the local medical man from time to time, and all individual case cards, records *et cetera* of the area served would remain at the centre itself.

The centre would comprise waiting-room, examination-room, surgery and small dispensary combined, bathroom, lavatory and other necessary offices.

The medical officer would also be provided with a house with simple furniture. The centre might be built under the same roof to form part of the house. Telephone and transport facilities—and, in a few cases, portable radio transceivers—would be provided.

This type of centre could largely replace the bush nursing system, the nurse being brought under the control of the doctor.

A considerable amount of domiciliary visiting would be necessary from such centres, owing to the scattered nature of the localities in which they will find their chief use. In some localities they will form part of special aeroplane transport services.

Provision will also be necessary for the cleaning of the centre. The doctor will need to perform his own office work, including records of cases, reports to the district medical officer *et cetera*. It will be necessary, probably, to provide professional assistance in the person of one nurse.

The doctor will be required to provide any advice or service in connexion with problems of public health or preventive medicine.

Conditions of Service.—At A class centres, commencing salary for junior officers will be £700 *per annum, plus* an allowance of £104 *per annum* for night calls. Rental will be charged for both house and furniture on an established percentage basis.

Medical officers will be required to spend at least two years out of the first five years of their service at an A class centre or a B class centre. If the medical officer remains for a longer period, as some may, his salary range will increase by the prescribed annual increments up to a maximum of £900 *per annum*.

Number of A Class Centres.—The numbers of these centres can be estimated with fair accuracy, and for the various Australian States are as follow:

New South Wales	109
Victoria	144
Queensland	38
South Australia	46
Western Australia	10
Tasmania	29
Total	376

The actual localities are shown in Appendix I.

In some places a considerable area and a large scattered population will depend upon the centre. There are even some of them where, at the present time, two or more doctors are resident. These are not sufficiently great in number to affect the general position.

Allowing for the elimination of competition and a better grouping system, the actual requirement of one-man centres in each State is estimated to be as follows:

New South Wales	125
Victoria	150
Queensland	40
South Australia	55
Western Australia	12
Tasmania	35
Total	417

The costs associated with each unit of these A class centres should not exceed:

		Unit Cost.
Capital—		
House	£1,750	
Furniture	£250	
		£2,000
Maintenance—		
Mileage, 12,000 miles at 4d. per mile	£200	
Drugs, dressings, instruments and sundries	£300	
Nurse's keep	£50	
		£550
Salaries—		
Doctor, £700-£900—mean	£800	
Allowance	£104	
Nurse	£200	
		£1,104

The rental of house and furniture can be calculated so as to return the capital cost of the house in twenty-five years and of the furniture in ten years.

It is possible that with modern transport for both patient and doctor, and the establishment of easily accessible modern diagnostic centres, the numbers of these A class centres will diminish, but the existing numbers are taken for the present discussion.

The total expenditure on A class centres is shown thus:

	No. of Doctors.	Capital.	Maintenance.	Salaries.
		£	£	£
Unit cost	—	2,000	550	—
N.S.W.	125	250,000	68,750	138,000
Vic.	150	300,000	82,500	165,600
Qld.	40	80,000	22,000	44,160
S.A.	55	110,000	30,250	60,720
W.A.	12	24,000	6,600	13,248
Tas.	35	70,000	19,250	38,640
Totals	417	834,000	229,350	460,368

B Class Centres.

The next unit in the scheme is provided by those centres having hospitals with a daily in-patient average of less than 40. Of these, some have one doctor practising at present; others have more than one.

Of these centres there are in extra-metropolitan localities:

	Hospitals.	Doctors.
New South Wales	92	161
Victoria	29	53
Queensland	93	125
South Australia	44	72
Western Australia	76	88
Tasmania	9	13
Totals	343	512

The table in Appendix II shows the numbers of in-patients (daily average) and the numbers of doctors practising in each town. The numbers of doctors are reasonably, but not absolutely, accurate. In some of these districts more than one doctor would not be necessary, and in some the numbers can be reviewed under a proper system, but the numbers shown will be accepted for the present discussion.

These units would be classed with A class centres as posts for junior officers who would commence at the minimum salary of £700. The doctor would be provided with house, furniture, telephone and car, on the same terms as A class centres. The consultation centre would, however, generally be at the hospital—the accommodation there would, in most cases, need to be supplemented by some additional building, but this would not be large. Probably an extra two nurses would have to be appointed. All consultations, as before, should be at the centre, except when the patient is not mobile. Discouragement of night calls is necessary here also, but payment of an allowance would apply as in the case of A class centres.

The salaries of the doctors can be computed at the mean of the class (£800). The members of the B class centre would have generally the same expenditure as shown under A class centre, but (*a*) the houses and furniture in some cases would need to be of a better class without any consultation facilities, (*b*) the maintenance expenses would be greater.

As each of these B class centres has a small hospital, all consultations will take place there, and for this purpose it might be necessary to spend £500 on building additions and to provide the salaries (£400) and keep (£100) of two additional nurses.

On this basis the following estimates might be made for each centre:

		Unit Cost.
Capital—		
Doctor's house	£1,750	
Furniture	£250	
Hospital additions	£750	
		£2,750
Maintenance—		
Mileage (12,000 miles)	£200	
Drugs, dressings, instruments and sundries	£400	
Nurses' keep	£100	
		£700
Salaries—		
Doctor (£700-£900)	£800	
Allowance	£104	
Nurses	£400	
		£1,304

The above applies in respect of one doctor at each hospital—for each doctor in excess of one in the town the expenses will be:

		Unit Cost.
Capital—		
House	£1,750	
Furniture	£250	
		£2,000
Maintenance—		
Mileage	£200	
		£200
Salary—		
£700-£900	£800	
Allowance	£104	
		£904

These estimates can be tabulated thus:
In respect of one doctor for each hospital—

	No. of Hospitals.	Capital.	Maintenance.	Salaries.
	£	£	£	£
Unit cost	—	2,750	700	1,304
N.S.W.	92	253,000	64,400	119,968
Vic.	29	79,750	20,300	37,816
Qld.	93	255,750	65,100	121,272
S.A.	44	121,000	30,800	57,376
W.A.	76	209,000	53,200	99,104
Tas.	9	24,750	6,300	11,736
Totals	343	943,250	240,100	447,272

But there are additional doctors, as follow:

New South Wales	69
Victoria	24
Queensland	32
South Australia	28
Western Australia	12
Tasmania	4
Total	169

For each of these the unit cost is:

Capital	£2,000
Maintenance	£200
Salary	£904

The totals in respect of these additional doctors are as follow:

	No. of Doctors.	Capital.	Maintenance.	Salaries.
	£	£	£	£
Unit cost	—	2,000	200	904
N.S.W.	69	138,000	13,800	62,376
Vic.	24	48,000	4,800	21,696
Qld.	32	64,000	6,400	28,928
S.A.	28	56,000	5,600	25,312
W.A.	12	24,000	2,400	10,848
Tas.	4	8,000	800	3,616
Totals	169	338,000	33,800	152,776

In quite a large number of towns, however, the hospital is situated some distance from the town. This brings into prominence a consideration which will have to be kept well in the reckoning throughout the whole of this outline. It has been an unfortunate feature of the evolution of social medicine that such activities as baby health centres, school medical inspection, ante-natal work, hookworm campaign examination centres, have steadily become more and more separated from the general medical work of the community. One of the objects to be achieved by the outline now presented is that of restoring the bond between the general practitioner and the social services. It is therefore desirable to bring such activities as those mentioned into close relationship with the general medical scheme, and, for this purpose, to place the consultation centres as near to existing activities, such as the baby health centre, as is possible in all towns in which the hospital is not centrally situated.

It is difficult to estimate the capital cost which may thus be involved beyond the additional buildings at the hospital. For computation purposes it is being assumed that the necessary building in such cases can be provided at an average capital cost of £1,000 and that such buildings will be necessary in half the total number of B class centres.

Taking half the number of centres (343) as 170, the estimated addition to the expenditure would be, for each unit:

Capital	£1,000
Maintenance—	
Drugs, dressings, instruments and sundries	£400

or a total of—

Capital	£170,000
Maintenance	£68,000

For small outlying villages round the larger towns of this type it may be necessary to contemplate the utilization for visits by the doctor on set days of existing facilities, such as the local school, hall or hotel.

The following table (being a combination of the three above tables) gives the total amount involved for B class centres:

	No. of Doctors.	Capital.	Maintenance.	Salaries.
	£	£	£	£
N.S.W.	161	391,000	78,200	182,344
Vic.	53	127,750	25,100	59,512
Qld.	125	319,750	71,500	150,200
S.A.	72	177,000	36,400	82,688
W.A.	88	233,000	55,600	109,952
Tas.	13	32,750	7,100	15,352
Totals	512	1,281,250	273,900	600,048
Additional centres	170	170,000	68,000	—
Grand total B class	—	1,451,250	341,900	600,048

There is one other consideration—provision of leave for the doctors in A and B class centres. These are to have

four weeks each year and three months every five years. That is, provision must be made for thirty-three (33) weeks' leave in five years for each man, that is, for one-eighth of his total in every five years he must be relieved, that is, a relieving staff of one-seventh of the total might well be provided.

The total medical practitioners in these two classes are:

New South Wales ..	286	Relieving staff ..	41
Victoria	203	Relieving staff ..	29
Queensland	165	Relieving staff ..	24
South Australia	127	Relieving staff ..	18
Western Australia ..	100	Relieving staff ..	14
Tasmania	48	Relieving staff ..	7
Total	929	Total	133
Relief doctors for relieving staff			10
		Total	143

The total salaries for relieving staff at £800 *per annum* would be £114,400. Incidental expenses, such as fares *et cetera*, for relieving officers, would have to be met; the question of whether medical officers on leave would have fares paid to capital cities would have to be decided.

Progressive totals at this stage for all Australia are:

	Capital.	Maintenance.	Salaries.
	£	£	£
A class centres ..	834,000	229,350	460,368
B class centres ..	1,451,250	341,900	600,048
Relieving staff ..	—	—	114,400
Totals	2,285,250	571,250	1,174,816

C Class Centres.

This class of centre is that which should be provided in districts having hospitals of daily average of 40-50 beds, and this class should have a consultation centre located at or in close association with the hospital. The locality relationship with existing health agencies, such as baby health centres, as described under the B class centres, should be remembered. For the consultation centre, speaking generally, the place of greatest accessibility is to be preferred. The unity of preventive and curative medicine should be practically expressed in this way to the fullest practicable extent.

This consultation centre should include one waiting room, two consultation rooms, two examination rooms, one X-ray room, one combined instrument and sterilizing room with laboratory bench, one room for health services, one nurses' duty room, one office and records room, lavatories.

These centres would be provided in communities approximating 5,000 in population. The actual localities are shown immediately at the end of this section.

For these centres one senior and three junior general practitioners would probably be sufficient with ready access to the specialist services of the district.[1]

The question of houses for doctors at these centres also would have to be faced—it might mean either building or purchasing from doctors at present in practice. Each centre would need to be considered separately.

In these centres additional emphasis is given to one of the basic principles of the whole of this scheme, namely, that the doctor's residence is not a consultation centre; it is his private home and is indicative of the fact that, with the introduction of this scheme, he closes (to his advantage) the "twenty-four hours per day" accessibility that is, at the present time, one of the greatest handicaps of private practice.

The C class centre, working in conjunction with the hospital, will provide all usual curative and preventive services for the community it serves. It will also generally assist A and B class centres in problems beyond their immediate capacity, either directly or through the agency of the district consultation services, which are next to be described. C class centres in their turn will rely upon the district consultation service for assistance with cases beyond their own capacity.

The consultation centre will be the headquarters for protective and preventive services other than those directly concerned with sanitation, sanitary engineering and the more mechanical aspects of public health.

If the hospital has an efficient X-ray plant, it would not be necessary to provide another. This would have to be determined for each centre.

[1] In holiday resorts such as the Berrima, Blue Mountains and Hawkesbury districts, probably more juniors would be required either seasonally or always.

The building should not cost more than £5,000, the equipment should not cost more than £1,500, and the maintenance costs should not exceed £500.

Three nurses would be required at the centre—salaries £200 each, maintenance £50 each.

Where house and furniture are provided, rental for both house and furniture is assessed on the usual departmental basis.

The expenditure, therefore, on each C class centre would be:

		Unit Cost.
Capital—		
Centre	£5,000	
Equipment	£1,500	
If house is to be provided with furniture, add—		
House	£1,750	
Furniture	£250	
		£8,500
Maintenance—		
Four cars (9,000 miles each)	£600	
Centre	£500	
Nurses' keep	£150	
		£1,250
Salaries—		
Doctors—		
One senior general practitioner (£1,100-£1,600)	£1,350	
Three junior general practitioners (£700-£900)	£2,400	
Nurses—three (£200)	£600	
		£4,350

In South Australia only two towns are in this group—Mount Gambier and Port Augusta. One of these does not require a full team as above, the other may require more; both are accepted, therefore, and included in the group.

Tabulated, this will be as follows:

The total expenditure on these C class centres is shown thus:

	No. of Centres.	Capital.	Maintenance.	Salaries.
		£	£	£
Unit cost ..	—	8,500	1,250	4,350
N.S.W.	11	93,500	13,750	47,850
Vic.	3	25,500	3,750	13,050
Qld.	2	17,000	2,500	8,700
S.A.	2	17,000	2,500	8,700
W.A.	1	8,500	1,250	4,350
Tas.	—	—	—	—
Totals ..	19	161,500	23,750	82,650

The hospitals having between 40 and 50 beds daily average are:

	Population.[1]	Daily Average.	No. of Doctors Practising.
New South Wales:			
Berrima (Mittagong, Moss Vale and Bowral)	—	49	5
Blue Mountains (Katoomba, Leura, Wentworth Falls and Blackheath)	—	43	11
Cootamundra	—	43	5
Forbes	5,355	44	5
Griffith	—	43	3
Hawkesbury	—	47	—
Kyogle	—	50	2
Mudgee	—	45	6
Temora	—	45	3
Walgett	—	48	1
Wyalong	—	42	3
Victoria:			
Ararat	—	44	4
Castlemaine	5,221	50	4
Swan Hill	—	45	4
Queensland:			
Ayr	—	46	4
Kingaroy	—	45	4
South Australia:			
Mount Gambier	5,542	47	6
Port Augusta	3,270	40	1
Western Australia:			
Geraldton	4,984	45	4
Tasmania: Nil.			

[1] Those not stated are below 5,000; these populations are the members within municipal boundaries; the population within the hospital district is in many cases much larger.

D Class Centres.

(Attention is drawn to paragraph 3 of the introduction to this "Outline", where it is stated that this section must be completely revised.)

With the end of C class centres (that is, 40-50 bed hospital centres) this outline passes from the country town type of population to the larger centres, and from this point it is necessary to begin to visualize the appearance of district centres (D class centres). It may be that it would be wise to elevate one or more of the C class centres to district centres, but that could be ascertained only by closer study than is possible at this stage, and for the purposes of this study it would be well to take the present distribution.

The localities involved are shown here so that discussion may proceed progressively:

D.—Centres with Hospitals having from 50-100 Beds.

	Population[1] (1933).	Daily Average.	No. of Doctors Practising.
New South Wales:			
Armidale	6,794	65	8
Bathurst (Orange)	10,413	59	7
Casino (Lismore)	5,287	52	4
Corowa (Albury)	—	72	3
Grafton	6,411	93	7
Kurri	—	75	3
Lithgow	13,444	76	3
Kempsey	—	54	4
Moree (Inverell)	—	57	3
Narrandera	—	59	4
Orange	9,634	93	16
Inverell	5,304	51	6
Taree	—	66	4
Murwillumbah	—	59	6
Wallsend	—	90	4
Victoria:			
Colac	—	79	7
Echuca	—	60	4
Hamilton	5,786	59	5
Horsham	5,273	93	4
Maryborough	5,631	52	5
Sale	—	96	5
St. Arnaud	—	57	3
Warragul	—	67	5
Warrnambool	8,906	99	8
Queensland:			
Atherton	—	62	1
Bundaberg	11,466	100	8
Charters Towers	6,978	52	4
Gympie	7,749	78	6
Innisfail	—	72	5
Mackay	10,665	97	7
Mount Morgan	—	55	1
Warwick	6,664	54	6
South Australia:			
There is no town with a hospital of this size, or larger, in South Australia outside the metropolitan area. It is obvious, however, that certain centres will be necessary, and these are discussed in Appendix III.			
Western Australia:			
Northam	4,917	53	3
Tasmania:			
Latrobe (Devon)	5,151	83	7
Australian Capital Territory:			
Canberra	7,325	88	7

[1] The populations shown are those within the municipal boundaries; the population within the hospital district is in most of these cases much larger.

E.—Centres with Hospitals of between 100 and 200 Beds.

	Population (1933).	Daily Average.	No. of Doctors Practising.
New South Wales:			
Albury	10,543	106	11
Broken Hill	26,925	171	8
Cessnock	14,385	123	7
Dubbo	8,344	109	4
Goulburn	14,849	100	9
Lismore	11,762	129	15
Maitland	8,191	141	7
Tamworth	9,913	105	10
Wagga	11,631	125	13
Waratah (Mater)	—	128	1
Wollongong	11,403	114	10

E.—Centres with Hospitals of between 100 and 200 Beds.—Continued.

	Population (1933).	Daily Average.	No. of Doctors Practising.
Victoria:			
Ballarat	37,411	172	30
Geelong	39,223	145	31
Mildura	6,617	157	6
Mooroopna	5,698	128	7
Wangaratta	—	103	7
Queensland:			
Cairns	11,993	133	8
Ipswich	22,498	124	10
Maryborough	11,415	104	6
Rockhampton	29,369	126	11
Toowoomba	26,423	148	26
Townsville	25,876	160	12
South Australia: Nil.			
Western Australia:			
Kalgoorlie	17,326	155	15
Tasmania: Nil.			

F.—Hospital having 200-400 Beds.

New South Wales:			
Newcastle	104,485	327	36
Victoria:			
Bendigo	29,131	227	27
Queensland: Nil.			
South Australia: Nil.			
Western Australia: Nil.			
Tasmania:			
Launceston	32,833	281	23

It is clear that these large centres of population will be the natural bases for administrative and consultative specialist purposes. In addition to these services applying to and serving the whole district of which this centre is a base, the ordinary services for the people resident in the town will need to be provided on a C class basis. In some towns one extra C class centre will be needed in addition to the district (D class) centre; in a few of the larger towns more than one such centre will be necessary.

The special conditions applying in the different towns are specially discussed in Appendix III. At this stage in this outline the district centre will be described and the requirements of the various towns tabulated so that the aggregate result can be shown.

It must be remembered, however, that the actual towns named as D class centres represent a schematic distribution only. Close study of geographical conditions, of transport facilities and similar factors will be necessary before the actual location of these D class centres can be determined. It is unlikely, however, that the total number for Australia will be materially altered whatever distribution is adopted, and accordingly the estimates given may be considered as reasonably approximate.

These district centres will be, as the name implies, the centres for the health and administrative, as well as the clinical, activities of the district.

In respect of their local functions, they should be located, as was indicated for the C class centres, at strategic points in the town. The principle of bringing the patient to the practitioner should be maintained as far as possible, but ample specialist facilities are provided in the outline, and these should be freely available to the whole population on the advice of the general practitioner attending. The maternal and child welfare services, the school medical services and other similar health agencies will have their headquarters at the D class centre.

A district centre will need larger accommodation than a C class centre. It might well consist of two waiting rooms, three consultation rooms, three examination rooms, one X-ray room, one out-patients' theatre, one combined instrument and sterilizing room, one plaster and splint room, one special senses examination room, one laboratory, one room for health services, one nurses' duty room, one office and records room, lavatories. Probably this will cost about £12,000 to build, £4,000 to equip and £1,500 *per annum* to maintain.

Staff.—The staff must consist of the local staff assigned to a C class centre, that is, one senior and three junior general practitioners, for all the local services. An additional nurse would be required at the centre at £200 *per annum*.

The staff then would be one senior and three junior general practitioners and four nurses.

No houses would be provided for the doctors at these centres.

Night and holiday duty would be taken on a roster basis—without any allowance, but with a satisfactory equivalent of leave or time off duty to compensate.

In addition, there should be the district consultant specialist services. These might be as follow:

	Salary at Mean.
One senior physician	£1,650
One junior physician	£1,250
One senior surgeon	£1,650
One junior surgeon	£1,250
One junior ophthalmologist	£1,250
One junior otologist	£1,250
One senior obstetrician	£1,650
One junior pædiatrician	£1,250
One junior radiologist	£1,250
One junior pathologist	£1,250
One junior orthopædist	£1,250
One psychiatrist	£1,250
Total salaries	£16,200

These district specialists would not be provided with houses, but would be provided with telephones and transport. For the twelve specialists and consultants, not more than six cars should be necessary—but this is subject to review, as they would have to be available for the whole district.

The radiologist, pathologist, psychiatrist and orthopædist would need to travel rarely, and in the other groups it is unlikely that the senior and junior would be travelling at the same time in more than one group.

Mileage, at £200 *per annum*, would amount to £1,200.

In addition to the above, there are the public health services for the district.

There should be for districts of the sizes visualized:

Four junior public health and school officers (£900-£1,000)	£3,800
One senior public health and school officer (£1,100-£1,400)	£1,250

These will require cars—total mileage of £1,000.

Female health visitors would be necessary; of these, eight for the district would probably be sufficient (one of them being supervising senior), at an average salary of £250 *per annum* = £2,000.

For transport small cars would be necessary for each, at a total capital cost of £2,400, and annual mileage cost of £800.

Finally there must be a district administrative staff. This might well be:

One senior medical administrative officer	£1,650
One junior medical administrative officer (clinical)	£1,250
One junior medical administrative officer (health)	£1,250

These would require office accommodation with three clerks and three typists—total annual amount of £1,500.

Some visiting would be necessary, but the mileage would be limited.

Summarizing this expenditure for a typical town in which there would be one D class centre comprising one C class centre with the additional administrative and specialist services, the typical unit cost can be shown thus:

Capital:			
District Centre		£12,000	
Equipment		£4,000	
			£16,000
Maintenance:			
Centre		£1,500	
Mileage—			
Clinical	£1,200		
Health	£1,000		
Health visitors	£800		
Administrative	£100		
Nurse's keep	£200		
		£3,300	
Office and records	£500		
		£500	
			£5,300
Salaries:			
C centre staff (7)		£4,350	
Additional nurse (1)		£200	
District staff, clinical (12)		£16,200	
Health officers (5)		£5,050	
Health visitors (8)		£2,000	
Administrative (3)		£4,150	
Clerical		£1,500	
			£33,450

The unit cost therefore of a D class centre is:

Capital	£16,000
Maintenance	£5,300
Salaries	£33,450

The discussion in Appendix III shows the schematic distribution of D class centres, but it also shows that there are certain towns with hospitals, having a daily in-patient average of over 50, which might well be provided with C class centres. The distribution in the appendix and the estimates which accompany them result in the following table of the total estimated cost.

	No. of Centres.	Capital.	Maintenance.	Salaries.
		£	£	£
N.S.W.	16	341,000	99,800	572,000
Vic.	15	291,000	86,000	527,850
Qld.	8	196,000	53,400	307,400
S.A.	5	80,000	27,000	90,850
W.A.	6	104,500	33,050	127,250
Tas.	3	49,000	13,100	80,600
A.C.T.	1	17,000	2,500	13,700
Totals	54	£1,078,500	£314,850	£1,719,650

Progressive totals at this stage therefore are:

	No. of Centres.	Capital.	Maintenance.	Salaries.
		£	£	£
A class	417	834,000	229,350	460,368
B class	343	1,451,250	341,900	600,048
Relieving A and B	—	—	—	114,400
C class	19	161,500	23,750	82,650
D class	54	1,078,500	314,850	1,719,650
Totals	833	£3,525,250	£909,850	£2,977,116

Capital Cities.

(Attention is drawn to paragraph 3 of the introduction to this "Outline", where it is stated that this section must be completely revised.)

The capital cities may be tabulated thus:

	Metropolitan Population.	No. of Doctors Practising.
Sydney	1,288,720	1,024
Melbourne	1,035,600	869
Brisbane	325,890	238
Adelaide	321,410	242
Perth	220,330	150
Hobart	63,250	49

The number of doctors are taken from "Knox's Medical Directory" (1938)—no more accurate distribution is available, nor is any distribution amongst the specialties available.

The populations are as at the 1933 census, and, although it is known that the populations are actually larger, these are the only reliable figures available.

A tentative distribution can be made on the following basis:

For every 10,000 of population:

One senior general practitioner.
Three junior general practitioners.

For every 50,000 of population:

Two senior physicians
Two junior physicians
} Physicians include dermatologists and tuberculosis specialists.

Two senior surgeons
Two junior surgeons
} Surgeons include gynæcologists and venereal specialists.

One junior obstetrician.
One junior special senses.
One junior radiologist.
One junior pædiatrician.

For every 100,000 of population:

Two senior obstetricians.
Two senior special senses.
Two senior radiologists.
Two senior pædiatricians.
One psychiatrist.
One pathologist.

The grouping would be as in the following table:

	Sydney.	Melbourne.	Brisbane.	Adelaide.	Perth.	Hobart.
Senior general practitioners (1,350)	125	104	32	32	22	6
Junior general practitioner (800)	375	312	96	96	66	18
Senior physicians (1,650)	50	42	12	12	8	2
Junior physicians (1,250)	50	42	12	12	8	2
Senior surgeons (1,650)	50	42	12	12	8	2
Junior surgeons (1,250)	50	42	12	12	8	2
Senior obstetricians (1,650)	25	20	6	6	4	1
Junior obstetricians (1,250)	25	20	6	6	4	1
Senior special senses (1,650)	25	20	6	6	4	1
Junior special senses (1,250)	25	20	6	6	4	1
Senior radiologists (1,650)	25	20	6	6	4	1
Junior radiologists (1,250)	25	20	6	6	4	1
Senior pædiatricians (1,650)	25	20	6	6	4	1
Junior pædiatricians (1,250)	25	20	6	6	4	1
Senior pathologist (1,650)	12	10	3	3	2	1
Senior psychiatrist (1,650)	12	10	3	3	2	1
Totals	924	764	230	230	156	42
Total now practising	1,024	869	238	242	150	49

This grouping of doctors represents in salaries and mileage at £200 *per annum*:

	Salaries.	Mileage.	Total.
	£		£
Sydney	1,088,350	184,800	1,273,150
Melbourne	898,600	152,800	1,051,400
Brisbane	269,100	46,000	315,100
Adelaide	269,100	46,000	315,100
Perth	181,900	31,200	213,100
Hobart	49,000	8,400	57,400
Totals	£2,756,050	£469,200	£3,225,250

This represents the following distribution according to population:

Sydney: One doctor to every 1,395 of population.
Melbourne: One doctor to every 1,355 of population.
Brisbane: One doctor to every 1,416 of population.
Adelaide: One doctor to every 1,397 of population.
Perth One doctor to every 1,412 of population.
Hobart: One doctor to every 1,506 of population.

This number is in excess of that generally regarded as necessary for the medical care of a community.

The alternative method is to group the population according to district centres of the D class already described.

Assuming first that a D class centre would be required for every 25,000 of population, this would give the following numbers:

Sydney	51	Adelaide	12
Melbourne	41	Perth	9
Brisbane	13	Hobart	2

On careful review these figures will probably be found to be excessive. For example, as a trial distribution, take centres distributed as follows:

Sydney:

Manly	Lidcombe	Randwick
Collaroy	Strathfield	Paddington
Mosman	Balmain	Bellevue Hill
North Sydney	Ashfield	Mascot
Lindfield	Leichhardt	Botany
Pymble	Glebe	Bankstown
Parramatta	Newtown	Kogarah
Ryde	Erskineville	Liverpool
Fairfield	Waterloo	

Add 8 more and there are then only 34, so that it is probable that 35 would be enough.

Melbourne:

Williamstown	Richmond	Oakleigh
Footscray	Kew	Dandenong
North Melbourne	Camberwell	Elsternwick
Brunswick	Box Hill	Brighton
Preston	Ringwood	Frankston
Fitzroy	Prahran	Essendon
Heidelberg	Malvern	

For Melbourne 24 centres would be enough.

Brisbane:

The Valley	Clayfield	Kangaroo Point
Hamilton	Indooroopilly	

For Brisbane estimate 10 centres.

Adelaide:

Prospect	Port Adelaide	Unley
Thebarton	Glenelg	Norwood

For Adelaide estimate 9 centres.

Perth:

Victoria Park	Subiaco	Fremantle
Marylands	Claremont	

For Perth estimate 6 centres.

Hobart:

New Town	Bellerive	Sandy Bay

For Hobart 3 centres would be enough.

Instead, therefore, of 126 metropolitan centres estimated on one centre for every 25,000 of population, probably 87 would be sufficient.

A detailed study of each metropolitan area would be needed to determine precisely the number and location of the doctor and the centres, but for this general discussion the figure given may be taken as a reasonable basis for discussion.

This would result in the following distribution:

Sydney	35
Melbourne	24
Brisbane	10
Adelaide	9
Perth	6
Hobart	3
Total	87

To recapitulate so that the position is clear, a district centre would be a building consisting of two waiting rooms, three consultation rooms, three examination rooms, one special senses examination room, one X-ray room, one out-patients' theatre, one combined instrument and sterilizing room, one plaster and splint room, one laboratory, one room for health services, nurses' duty room, office and records room, lavatories. This would cost £12,000 to build, £4,000 to equip, and £1,500 *per annum* to maintain. The total maintenance costs would be as shown for D class centres—£5,300.

The staff would be:

One senior general practitioner	£1,350
Three junior general practitioners (£800)	£2,400
One senior physician	£1,650
One junior physician	£1,250
One senior surgeon	£1,650
One junior surgeon	£1,250
One junior ophthalmologist	£1,250
One junior otologist	£1,250
One senior obstetrician	£1,650
One senior pædiatrician	£1,650
One junior pædiatrician	£1,250
One junior radiologist	£1,250
One junior pathologist	£1,250
One psychiatrist	£1,250
Total: 16 doctors.	Total: £20,350.

But it is considered that, for capital cities, the balance between general practitioners and specialists is too uneven.

It is therefore considered that each centre should have four (4) senior and twelve (12) junior general practitioners, and that the group of specialists shown should be available for each four of the city centres.

There would be also at each centre four nurses, at an average salary of £250, and there would be mileage which might be estimated at £3,000.

Medical officers engaged in health duties and health visitors will be discussed under the State administrative staff. No administrative staff would be necessary at these district centres, but one senior medical administrative officer would be desirable at £1,750-£2,000—mean salary £850.

This would give as expenditure:

Capital cost at £16,000 per centre.

	No. of Centres.	Total Cost.
Sydney	35	£560,000
Melbourne	24	£384,000
Brisbane	10	£160,000
Adelaide	9	£144,000
Perth	6	£96,000
Hobart	3	£48,000
Total	87	£1,392,000

Maintenance costs at £5,300 per centre:

	No. of Centres.	Total Cost.
Sydney	35	£185,500
Melbourne	24	£127,200
Brisbane	10	£53,000
Adelaide	9	£47,700
Perth	6	£31,800
Hobart	3	£15,900
Totals	87	£461,100

Salaries: Salaries must be shown separately for each capital city.

Sydney (35 Centres).

140	senior general practitioners (1,350)	£189,000
420	junior general practitioners (800)	£336,000
10	senior physicians (1,650)	£16,500
10	junior physicians (1,250)	£12,500
10	senior surgeons (1,650)	£16,500
10	junior surgeons (1,250)	£12,500
10	junior ophthalmologists (1,250)	£12,500
10	junior otologists (1,250)	£12,500
10	senior obstetricians (1,650)	£16,500
10	senior pædiatricians (1,650)	£16,500
10	junior pædiatricians (1,250)	£12,500
10	junior radiologists (1,250)	£12,500
5	psychiatrists (1,250)	£6,250
35	junior pathologists (1,250)	£43,750
35	administrative officers (1,850)	£64,750
735		£780,750

Melbourne (24 Centres).

96	senior general practitioners (1,350)	£129,600
288	junior general practitioners (800)	£230,400
6	senior physicians (1,650)	£9,900
6	junior physicians (1,250)	£7,500
6	senior surgeons (1,650)	£9,900
6	junior surgeons (1,250)	£7,500
6	junior ophthalmologists (1,250)	£7,500
6	junior otologists (1,250)	£7,500
6	senior obstetricians (1,650)	£9,900
6	senior pædiatricians (1,650)	£9,900
6	junior pædiatricians (1,250)	£7,500
6	junior radiologists (1,250)	£7,500
3	psychiatrists (1,250)	£3,750
24	junior pathologists (1,250)	£30,000
24	administrative officers (1,850)	£44,400
495		£522,750

Brisbane (10 Centres).

40	senior general practitioners (1,350)	£54,000
120	junior general practitioners (800)	£96,000
3	senior physicians (1,650)	£4,950
3	junior physicians (1,250)	£3,750
3	senior surgeons (1,650)	£4,950
3	junior surgeons (1,250)	£3,750
3	junior ophthalmologists (1,250)	£3,750
3	junior otologists (1,250)	£3,750
3	senior obstetricians (1,650)	£4,950
3	senior pædiatricians (1,650)	£4,950
3	junior pædiatricians (1,250)	£3,750
3	junior radiologists (1,250)	£3,750
2	psychiatrists (1,250)	£2,500
10	junior pathologists (1,250)	£12,500
10	administrative officers (1,850)	£18,500
212		£225,800

Adelaide (9 Centres).

36	senior general practitioners (1,350)	£48,600
108	junior general practitioners (800)	£86,400
3	senior physicians (1,650)	£4,950
3	junior physicians (1,250)	£3,750
3	senior surgeons (1,650)	£4,950
3	junior surgeons (1,250)	£3,750
3	junior ophthalmologists (1,250)	£3,750
3	junior otologists (1,250)	£3,750
3	senior obstetricians (1,650)	£4,950
3	senior pædiatricians (1,650)	£4,950
3	junior pædiatricians (1,250)	£3,750
3	junior radiologists (1,250)	£3,750
2	psychiatrists (1,250)	£2,500
9	junior pathologists (1,250)	£11,250
9	administrative officers (1,850)	£16,650
194		£207,700

Perth (6 Centres).

24	senior general practitioners (1,350)	£32,400
72	junior general practitioners (800)	£57,600
2	senior physicians (1,650)	£3,300
2	junior physicians (1,250)	£2,500
2	senior surgeons (1,650)	£3,300
2	junior surgeons (1,250)	£2,500
2	junior ophthalmologists (1,250)	£2,500
2	junior otologists (1,250)	£2,500
2	senior obstetricians (1,650)	£3,300
2	senior pædiatricians (1,650)	£3,300
2	junior pædiatricians (1,250)	£2,500
2	junior radiologists (1,250)	£2,500
1	psychiatrist (1,250)	£1,250
6	junior pathologists (1,250)	£7,500
6	administrative officers (1,850)	£11,100
129		£138,050

Hobart (3 Centres).

12	senior general practitioners (1,350)	£16,200
36	junior general practitioners (800)	£28,800
2	senior physicians (1,650)	£3,300
2	junior physicians (1,250)	£2,500
2	senior surgeons (1,650)	£3,300
2	junior surgeons (1,250)	£2,500
2	junior ophthalmologists (1,250)	£2,500
2	junior otologists (1,250)	£2,500
2	senior obstetricians (1,650)	£3,300
2	senior pædiatricians (1,650)	£3,300
2	junior pædiatricians (1,250)	£2,500
2	junior radiologists (1,250)	£2,500
1	psychiatrist (1,250)	£1,250
3	junior pathologists (1,250)	£3,750
3	administrative officers (1850)	£5,550
75		£83,750

The cost of these centres therefore would be:

	No. of Centres.	Capital.	Maintenance.	Salaries.
		£	£	£
Sydney	35	560,000	185,500	780,750
Melbourne	24	384,000	127,200	522,750
Brisbane	10	160,000	53,000	225,800
Adelaide	9	144,000	47,700	207,700
Perth	6	96,000	31,800	138,050
Hobart	3	48,000	15,900	83,750
Totals	87	1,392,000	461,100	1,958,800

The number of medical men in this arrangement would be:

	No. of Centres.	No. of Doctors.	Proportion to Population.	No. of Doctors now Practising.	Proportion to Population.
Sydney	35	735	1,753	1,024	1,258
Melbourne	24	495	2,092	869	1,191
Brisbane	10	212	1,537	238	1,369
Adelaide	9	194	1,657	242	1,328
Perth	6	129	1,708	150	1,468
Hobart	3	75	843	49	1,291
Totals	87	1,840	—	2,572	—

This table shows that, with this distribution, Sydney would have more than the number required for one doctor to every 2,000 of population. Melbourne has about the right number. The other four capitals would have too many doctors.

BUT, considering the total numbers—the number shown for the six capital cities is 1,840; the number necessary for the six capitals on the 1933 population in the ratio of 1 to 2,000 of population is 1,611. Allowing for a 10% increase in population since 1933, and for some redistribution of the figures as between capitals, the number shown in these tables is not excessive for the purposes of this estimate (1 in every 1,946 of population).

State Administrative Expenses.

Each State must have a central administrative staff. This might well consist of:

	Per Annum.
One commissioner (this should essentially be a medical officer preferably trained in public health administration)	£2,000
One public health deputy	£1,750
Two clinical deputies	£3,500
One staff deputy	£1,750
One hospitals deputy	£1,750
	£10,750

These six officers would form the consultative council for the State, the ultimate executive authority resting with the commissioner.

Officers of the junior responsible specialist grade would be needed in the central State office to the following numbers:

Sydney	6
Melbourne	5
Brisbane	4
Adelaide	4
Perth	3
Hobart	3

Total, 25 at £1,250 *per annum* = £31,250

A supply branch for hospital and medical supplies would be essential.

Vacancies on account of leave and sickness will be filled in every case from a similar specialist of the same grade or one grade below.

A central laboratory should exist in each State—these or the nuclei of them already exist in all States.

Organized post-graduate training systems would be necessary.

Two health visitors should be attached to each metropolitan centre. The numbers of these would be:

Sydney	70	Adelaide	18
Melbourne	48	Perth	12
Brisbane	20	Hobart	6

One hundred and seventy-four at an annual salary of £250, and mileage at £100, amounts to salaries £43,500, and maintenance £17,400.

The State staff should also include:

One senior matron	£500
Two deputy matrons (£400)	£800

The State staffs might be summarized:

For all States—

Administrative	£64,500
Junior medical	£31,250
Health visitors	£43,500
Matrons	£7,800
Clerical services and office expenses	£15,000
Maintenance	£17,400
	£179,450

Commonwealth Administrative Expenses.

As the system is assumed to be a Commonwealth system, a central administrative staff would be necessary. This should consist of three commissioners:

One chief commissioner	£2,500
One senior deputy commissioner	£2,250
One junior deputy commissioner	£2,000
	£6,750

These three would constitute a board which would determine all matters of policy.

Additionally there would be:

One senior public health officer for all international matters, including quarantine	£1,650
One senior public health officer for all internal aspects, including epidemics	£1,650
One senior officer dealing with hospital construction and administration	£1,650
One senior clinician dealing with all Commonwealth matters, such as public service pensions *et cetera*	£1,650
Six junior officers for all aspects of departmental work	£7,500
One senior matron dealing with nursing matters and health visitors	£750
Total	£14,850

The Commonwealth administration expenses would be:

Commissioners	£6,750
Medical staff	£14,100
Matron	£750
Office and incidental expenses	£10,000
Total	£31,600

Relief staffs to provide medical officers for the C, D and administrative groups would be necessary. These are calculated on the basis of three weeks' leave and an average over the whole group of one week's sick leave annually, that is, four weeks per man annually. The total of 1,146 divided by 13 gives 88. Allowing a relieving staff of 90 at an average salary of £1,000 means adding £90,000 to the annual salary total. An additional £10,000 would cover similar relief staff for other officers in the service.

The summarized expenditure for the whole service for all States will be:

	Capital.	Maintenance.	Salaries.
	£	£	£
Extra-metropolitan	3,525,250	909,850	2,977,116
Metropolitan	1,392,000	461,100	1,958,800
State administrative	—	32,400	147,050
C/wealth administrative	—	10,000	21,600
Relieving staffs	—	—	100,000
Totals	£4,917,250	£1,413,350	£5,204,566

The total medical staff necessary to give effect to this service would be:

Extra-metropolitan	2,463
Metropolitan	1,640
Metropolitan relieving	100
	4,203

The number estimated to be in practice at present in Australia is 4,000.

The present expenditure on health, hospitals, lunacy and education medical services is shown in the following table:

Health.	£	Lunacy.	£
N.S.W.	490,000	N.S.W.	897,000
Vic.	167,000	Vic.	554,000
Qld.	103,000	Qld.	260,000
S.A.	41,000	S.A.	165,000
W.A.	73,000	W.A.	128,000
Tas.	43,000	Tas.	71,000
Commonwealth—			
N. Territory	30,000		
Special	180,000		
General	103,000		
Total	£1,230,000	Total	£2,075,000

Hospitals.	£	Education, Medical.	£
N.S.W.	2,932,000	N.S.W.	35,000
Vic.	2,141,000	Vic.	16,000
Qld.	1,186,000	Qld.	26,000
S.A.	631,000	S.A.	6,000
W.A.	489,000	W.A. (see Health)	—
Tas.	165,000	Tas.	7,000
Commonwealth—			
N. Territory	20,000		
Total	£7,564,000		£90,000

The "special services" indicated in the above table under the heading of Commonwealth Health are Commonwealth Serum Laboratories, Commonwealth X-Ray and Radium Laboratory, School of Public Health and Tropical Medicine, and Institute of Anatomy. These would continue under any new scheme, but have not been discussed in the outline of new services discussed in the preceding pages.

The position, if the Commonwealth Government took over all existing hospitals, public health services, lunacy services, and school medical officer services is indicated in the following table. It is assumed that hospital and lunacy services would be transferred at their existing costs—definite savings on hospital maintenance would result from the establishment of district centres; these savings would balance any expenditure necessary for hospital improvement:

	Present Expenditure.	Expenditure under New Proposals.
	£	£
Hospitals	7,564,000	7,564,000
Lunacy	2,075,000	2,075,000
Education	90,000	—
Health—		
State	1,230,000	—
Commonwealth general	103,000	—
Commonwealth special	210,000	210,000
Totals	£11,272,000	£9,849,000

This total of £9,849,000 to which the Commonwealth would be newly committed would be a transfer from State to Commonwealth finance, but no added burden to the taxpayer. The expenditure under Health and Education would be merged in the general medical scheme, which would, as stated above, involve:

Capital expenditure	£4,917,250
Maintenance	£1,413,350
Salaries	£5,204,566

Putting capital expenditure on one side as an item necessary to launch the scheme, the annually recurring expenditure under this scheme would be £6,617,916, from which must be taken £1,320,000, representing present expenditure on health and education medical services, leaving £5,297,916, or approximately five and a quarter million pounds as the cost of the new elements in the scheme, apart from the capital expenditure shown.

While it is not thought that any of the items included in this estimate are unnecessary, it is probable that some have been overlooked.

It is considered desirable, therefore, to add an arbitrary figure of 15% to these estimates.

This would bring the total figures to:

Capital	£5,654,837
Maintenance	£1,625,352
Salaries	£5,985,250

As against this cost must be considered:

(*a*) that the expenditure by friendly societies on medical attendance and medicine (1938) was £864,341;

(*b*) that the estimated payments to medical men under the National Insurance Act amounted to one million pounds;

(*c*) that the estimated average of annual gross incomes of medical men is £1,800—there are 4,000 doctors listed, amounting to £7,200,000 paid to doctors by the public.

This outline offers one method by which better standards for doctors and better service to the public can be secured.

Two interesting tables are appended; one shows the relative degree of hospitalization of the community in each of the States and the other shows the relative distribution of invalid pensioners. These two tables give rough indications of the relative incidence in each of the States of acute and chronic illness respectively.

	Population.	No. of Hospitals.		In-Patients Admitted 1937.	
		No.	Per H.T.P.[1]	No.	Per H.T.P.
N.S.W.	2,735,695	207	7	224,504	8,217
Vic.	1,873,760	71	3	88,190	4,777
Qld.	1,004,150	117	12	103,651	10,322
S.A.	595,109	54	9	34,707	5,832
W.A.	462,461	92	20	41,409	8,960
Tas.	241,407	19	8	19,187	7,948

Invalid Pensioners.

	No. of Invalid Pensioners at 30.6.39.	Estimated Population at 30.6.39.	I.P. per H.T. of Population.	Annual liability at 30.6.39 to I.P.'s	
				Total. £	Per Head of Population.
N.S.W.	41,887	2,746,871	1,525	2,110,238	15/4
Vic.	19,471	1,881,433	1,035	983,216	10/5
Qld.	12,070	1,016,498	1,187	611,286	12/–
S.A.	6,749	595,770	1,133	339,508	11/5
W.A.	5,116	465,429	1,099	258,076	11/1
Tas.	3,519	236,653	1,487	177,528	15/–

[1] H.T.P. = 100,000 of population.

It is felt at this juncture that sufficient has been written to justify the submission of this as a practical scheme for governmental, professional and public consideration.

It is recognized, however, that further investigation would be needed to establish the appropriate place in this scheme of the following activities:

Nurses' registration and ancillary services, massage *et cetera*.
Maternity.
Child welfare.
Retiring age of medical men: (*a*) hospitals, (*b*) from service.
Relation of national medical to medical education.
Registration and deregistration of medical men.
Private hospitals.
Compensation payable to medical men.

Appendix I.[1] A Class Centres.

NOTE: In some places more than one doctor is in practice. This is indicated in brackets in each instance.

New South Wales.

Adelong
Albion Park
Alstonville
Ardlethan
Ariah Park
Bangalow (2)
Baradine
Barellan
Barham
Barmedman
Bateman's Bay
Belmont (3)
Bermagui
Berrigan
Berry
Bigga
Binnaway
Binna Burra
Bowraville
Branxton (2)
Broadwater
Bulahdelah
Bungendore
Byron Bay (2)
Campbelltown
Candelo
Cassilis
Catherine Hill Bay
Cobargo
Coolamon
Copmanhurst
Coramba
Corrimal (2)
Crescent Head
Cudal
Culcairn
Cumnock
Dapto
Denman (2)
Dora Creek
Dunedoo (2)
East Gresford
Eden
Eugowra
Ganmain
Gladstone
Gloucester (2)
Gulargambone
Gunning
Guyra (2)
Helensburg
Henty (2)
Holbrook
Jervis Bay
Junee (2)
Kandos
Lawson
Lockhart (2)
Lyndhurst (2)
Macksville (2)
Mandurama
Manildra
Mendooran
Nabiac
Narooma
Narromine
Nimbin
Nowra (3)
Oberon
Ourimbah
Paterson
Picton
Pleasant Hills
Port Kembla (2)
Port Macquarie (2)
Quandialla
Raymond Terrace (2)
Richmond
Rooty Hill
St. Mary's
South Woodburn
Springwood (2)
Stockinbingal
Stroud
Tallimba
Teralga
Tea Gardens
The Entrance
The Rock
Thirroul
Tocumwal
Trangie
Trundle
Tullamore
Tuncurry
Ulmarra
Ungarie
Walla Walla
Wauchope (2)
Werris Creek
Weston
Windsor (2)
Wingham (2)
Woodburn
Woodstock
Woolgoolga
Woy Woy
Wyong
Yenda.

Victoria.

Avoca
Bacchus Marsh
Ballan
Balliang
Barwon Heads
Beaufort
Beeac
Belgrave
Benalla
Berwick
Beulah
Birchip
Birregurra
Boort
Bright
Broadford
Buninyong
Bunyip
Charlton
Chelsea
Chiltern
Cobden
Coleraine
Cowes
Cranbourne
Croydon
Dandenong
Daylesford
Dimboola
Donald
Dromana
Drouin
Eaglehawk
Edenhope
Elmore
Euroa
Ferntree Gully
Frankston (6)
Foster
Garfield
Gisborne
Glenthompson
Goroke
Hall's Gap
Hastings
Healesville
Heyfield
Heywood
Hopetoun
Jeparit
Kaniva
Katamatite
Kerang (3)
Koo-Wee-Rup
Koroit
Korumburra
Kyabram
Lancefield
Lang Lang
Learmonth
Leongatha
Lilydale (3)
Lismore

[1] It is known that the numbers given in these appendices representing the numbers of doctors practising in different localities are not invariably accurate. No source of information other than "Knox's Medical Directory and Gazetteer" was available. This was published in 1938 and changes have occurred since then. Various checks have been made and it is considered that the totals upon which the estimates in this outline are based are, as gross figures, reasonably accurate.

Victoria—Continued.

Loch	Nyah West	Terang
Lockington	Pakenham East	Tongala
Macarthur	Penshurst	Toora
Maffra	Portalington	Trafalgar
Malmsbury	Pyramid Hill	Traralgon (4)
Meeniyan	Quambatook	Trentham
Merbein	Queenscliff	Ultima
Meredith	Rainbow	Violet Town
Merino	Red Cliffs	Walwa
Metung	Rochester (3)	Warburton
Minyip	Rokewood	Wedderburn
Mirboo North	Romsey	Werribee
Mitiamo	Rosebud	Werrimul
Moe	Rupanyup	Whittlesea
Mornington	Rushworth	Willaura
Mortlake	Rutherglen	Winchelsea
Mount Macedon	Sassafras	Wodonga
Morwell	Scotsburn	Woodend
Murchison	Sea Lake	Woomelang
Murrayville	Seymour	Woori Yallock
Murtoa	Somerville	Yackandandah
Myrtleford	Sorrento	Yallourn
Nagambie	Skipton	Yarra Junction
Nathalia	Smythesdale	Yarrawonga
Neerim South	Sunbury	Yea
Numurkah	Tatura	

Queensland.

Allora (3)	Duaringa	Oakey
Beenleigh (2)	Emu Park	Palmwoods
Buderim	Eumundi	Pialba
Burleigh Heads	Gatton	Pittsworth
Caboolture	Glenmorgan	Pomona
Caloundra	Goomeri	Redcliffe (2)
Childers (2)	Howard (2)	Rosewood
Cleveland (2)	Jandowae	Sarina
Clifton (2)	Killarney	Southport
Cooktown	Lowood	Sylvia Vale
Cooroy	Marburg (2)	Toogoolawah
Crows Nest	Mt. Coolon	Woodford
Dayboro	Murgon	

South Australia.

Aldgate	Kadina (3)	Port Wakefield
Ardrossan	Karoonda (2)	Quorn
Auburn	Kingston	Robe
Berri	Kooringa (2)	Stirling
Brinkworth	Laura	Strathalbyn
Bute	Lobethal	Tailem Bend
Clarendon	MacGillivray	Tanunda (2)
Crafers	Mallala	Tea Tree Gully
Cummins	Moonta (2)	Terowie
Curramulka (2)	Morphett Vale	Uraidla (2)
Freeling	Mt. Lofty (2)	Whyalla
Gladstone (2)	Mount Pleasant	Willunga
Glandore	Nairne	Woodside (2)
Gumeracha	Nuriootpa	Yankalilla
Hahndorf	Penola	
Hamley Bridge	Port Broughton	

Western Australia.

Armadale	Dowerin	Meckering
Brunswick Junction	Kalamunda	Mundaring
Carnamah	Koorda	New Norcia
Donnybrook		

Tasmania.

Bothwell	Gormanston	Sheffield
Burnie (3)	Huonville (2)	Smithton (2)
Cygnet	Longford (2)	Sorell (2)
Deloraine	Moonah (2)	Stanley
Derby	Oatlands	Strahan
Evandale	Penguin	Swansea
Fingal (2)	Rosebery	Tarraleah
Flinders Island	Rosetta	Waratah (3)
Franklin	Rowella	Westbury
Geeveston	St. Helens (2)	

Appendix II. B Class Centres.

The following table shows the hospitals in the different States which have a daily average of less than 40 beds:

New South Wales.

	Daily Average. Beds.	No. of Doctors Practising.		Daily Average. Beds.	No. of Doctors Practising.
Adaminaby	1	—	Bellinger River		
Ballina	20	2	District	28	2
Balranald	10	1	Bingara	8	1
Barraba	10	2	Blayney	8	2
Bega	35	2	Boggabri	6	2
Bombala	11	1	Kiama	21	2
Bonalbo	1	1	Lake Cargelligo	12	1
Bourke	29	2	Leeton	36	4
Braidwood	7	1	Maclean	17	4
Brentwood	34	—	Manilla	15	2
Brewarrina	14	1	Merriwa	7	1
Bulli	34	3	Milton and Ulladulla	3	1
Bundara	3	1	Molong	19	3
Burrowa	10	—	Moruya	5	1
Camden	30	2	Murrumburah Harden	12	3
Coraki	14	2	Murrurundi	6	2
Canowindra	20	1	Narrabri	23	3
Carcoar	11	2	Nepean District	27	3
Cobar	19	1	Nyngan	12	2
Coff's Harbour	33	2	Pambula	18	1
Collarenebri	11	1	Parkes	36	4
Condobolin	23	1	Peak Hill	8	1
Coolah	6	1	Portland	14	1
Cooma	26	3	Queanbeyan	30	3
Coonabarabran	23	2	Quirindi	25	3
Coonamble	28	2	Rylstone	12	1
Cowra	30	2	Scone	30	4
Crookwell	30	2	Sofala	2	—
Dangar	19	—	Tenterfield	19	3
Delegate	4	1	Tibooburra	3	—
Deniliquin	21	3	Tingha	7	1
Dorrigo	14	1	Tottenham	2	1
Dungog	12	2	Tumbarumba	6	1
Finley	6	1	Tumut	20	2
Gilgandra	13	2	Urana	6	1
Glen Innes	38	6	Vegetable Creek	10	—
Goodooga	1	1	Walcha	6	2
Grenfell	22	4	Warialda	10	1
Gulgong	19	3	Warren	8	1
Gundagai	19	2	Wee Waa	10	1
Gunnedah	36	4	Wellington	27	4
Hastings	15	—	Wentworth	10	1
Hay	37	3	Wilcannia	11	1
Hillston	11	1	Yass	29	2
Illawarra	24	—	Young	35	4
Ivanhoe	2	—			
Jerilderie	26	1			
Kentucky	1	—			

Victoria.

Alexandra	9	2	Managatang	4	1
Bairnsdale	33	5	Mansfield	12	1
Beechworth	20	1	Nhill	19	2
Camperdown	15	3	Omeo	4	1
Casterton	18	2	Orbost	11	2
Clunes	10	1	Ouyen	26	1
Corryong	10	1	Port Fairy	13	2
Creswick	17	2	Portland	18	3
Daylesford	19	2	Stawell	24	2
Dimboly	20	2	Tallangatta	13	1
Heathcote	5	1	Warracknabeal	37	3
Inglewood	24	2	Wycheproof	12	1
Kelmore	17	1	Wonthaggi	31	2
Kyneton	23	3	Yarram	30	2
Maldon	20	1			

Queensland.

Adavale	1	—	Cook	9	—
Aramac	4	1	Cracow	5	—
Augathella	6	—	Croydon	18	1
Babinda	22	1	Cunnamulla	12	1
Baralaba	7	—	Dalby	33	3
Barcaldine	11	1	Dirrandbandi	6	1
Beaudesert	23	2	Eidsvold	6	1
Biggenden	14	1	Emerald	11	1
Biloela	11	1	Esk	13	1
Birdsville	1	—	Forsayth	1	—
Blackall	12	2	Gayndah	15	1
Blair Athol	3	1	Georgetown	1	—
Boonah	18	2	Gin Gin	8	1
Boulia	2	—	Gladstone	35	3
Bowen	22	3	Goondiwindi	31	3
Burketown	3	—	Gordonvale	12	1
Camooweal	4	—	Harrisville	2	1
Canungra	2	1	Herberton	27	1
Charleville	20	3	Home Hill	23	2
Chillagoe	11	1	Hughenden	18	1
Chinchilla	11	1	Ingham	39	3
Clermont	19	2	Inglewood	5	1
Cloncurry	26	3	Isis	15	—
Collinsville	18	1	Isisford	3	—

Queensland—Continued.

	Daily Average. Beds.	No. of Doctors Practising.		Daily Average. Beds.	No. of Doctors Practising.
Jericho	5	—	Nanango	19	2
Julia Creek	8	—	Normanton	4	1
Jundah	1	1	Proserpine	25	1
Kilcoy	9	1	Quilpie	7	1
Kynuna	1	—	Richmond	8	2
Laidley	12	1	Roma	35	3
Longreach	19	3	Sapphire	1	—
Maleny	8	1	Springsure	8	—
Many Peaks	1	—	St. George	21	1
Mareeba	36	1	Stanthorpe	36	3
Miles	11	1	Surat	4	1
Mitchell	11	1	Tambo	5	1
Monto	19	1	Tara	3	1
Mossman	19	—	Taroom	4	2
Mt. Perry	3	1	Texas	9	1
Mt. Isa	35	2	Thargomindah	1	1
Mt. Garnet	1	—	Thursday Island	20	1
Mt. Molloy	1	—	Tully	26	2
Mt. Mulligan	1	1	Wallumbilla	1	1
Mundubbura	18	1	Winton	14	1
Mungindi	9	—	Wondai	33	2
Muttaburra	4	1	Yeppoon	9	1
Nambour	35	2			

South Australia.

Angaston	12	1	Mannum	8	3
Balaklava	16	1	Millicent	8	1
Barmera	21	1	Minlaton	7	1
Blyth	8	1	Morgan	2	—
Booleroo Centre	16	1	Mount Barker	10	2
Border Town	15	—	Murray Bridge	24	4
Burra	18	2	Narracoorte	27	3
Clare	14	3	Orroroo	12	1
Cleve	9	—	Peterborough	18	2
Cowell	5	1	Pinnaroo	6	1
Crystal Brook	14	1	Port Lincoln	21	3
Elliston	2	—	Port Pirie	38	4
Eudunda	13	1	Renmark	18	3
Gawler	20	5	Riverton	12	1
Hawker	3	3	Snowtown	4	2
Jamestown	17	2	Streaky Bay	9	2
Kapunda	15	1	Tumby Bay	15	1
Kimba	5	1	Victor Harbour	12	2
Kingscote	5	1	Waikerie	6	1
Lameroo	3	1	Wallaroo	38	2
Loxton	11	2	Wundinna	7	2
Maitland	9	1	Yorketown	14	1

Western Australia.

Albany	30	6	Meekatharra	6	1
Beverley	6	2	Menzies	1	—
Big Bell	10	—	Merredin	22	3
Boyup Brook	2	2	Moora	7	1
Bridegtown	11	2	Mornington	1	—
Brookton	3	—	Morawa	7	1
Broome	5	1	Mount Barker	8	1
Bruce Rock	5	1	Mount Magnet	9	1
Bunbury	29	4	Mullewa	8	1
Busselton	21	3	Nannup	4	1
Carnarvon	9	1	Narembeen	1	1
Collie	31	3	Narrogin	28	2
Coolgardie	12	—	Norseman	19	1
Corrigin	12	1	Northampton	7	1
Cue	7	1	Onslow	2	1
Cunderdin	4	1	Pemberton	7	1
Dalwallinu	8	1	Pingelly	4	1
Derby	2	1	Pinjarra	10	1
Dumbleyung	2	1	Port Hedland	6	1
Dwellingup	10	—	Quairading	8	1
Esperance	3	1	Reedy	8	—
Goomalling	8	1	Roebourne	3	1
Gnowangerup	7	2	Sandstone	1	—
Hall's Creek	1	—	Southern Cross	13	2
Harvey	12	3	Tambellup	1	1
Jarrahdale	1	2	Three Springs	7	1
Katanning	20	2	Toodyay	—	1
Kellerberrin	9	1	Wagin	6	2
Kojonup	6	1	Wickepin	3	1
Kukerin	1	—	Westonia	1	—
Kondinin	1	—	Williams	2	—
Kununoppin	2	1	Wiluna	10	2
Lake Grace	9	1	Wongan Hills	7	—
Laverton	8	1	Wyalkatchem	5	1
Leonora	9	1	Wyndham	2	2
Manjimup	12	1	Yarloop	22	1
Marble Bar	4	1	York	9	2
Margaret River	13	1	Youanmi	2	—

Tasmania.

	Daily Average. Beds.	No. of Doctors Practising.		Daily Average. Beds.	No. of Doctors Practising.
Beaconsfield	9	1	Scottsdale	12	1
Campbelltown	14	2	St. Mary's	5	1
Currie—King Island	5	1	Ulverstone	13	2
Queenstown	28	2	Wynyard	27	2
			Zeehan	21	1

Appendix III. D Class Centres.

In this appendix an attempt is made to group country towns with a daily hospital in-patient average of over 50 according to their conditions, allotting full D class centres or modified variants according to the presumed local needs. The full table of the towns concerned is given at the commencement of the section relating to D class centres.

New South Wales.

BATHURST is between Orange and Lithgow. Both Bathurst and Lithgow could be served by C class centres, while Orange becomes a district centre.

COROWA is near to Albury and can be served by a C class centre, Albury being the district centre.

INVERELL is at the extreme of a branch line of communication and can be served by a C class centre, Moree being the district centre.

CASINO and MURWILLUMBAH can be served by a C class centre, Lismore being the district centre.

So that there will be in New South Wales:

Towns having C Class Centres.

Bathurst	Corowa	Lithgow
Casino	Inverell	Murwillumbah

Hospital Towns becoming District Centres.

Armidale	Kempsey	Tamworth
Albury	Lismore	Taree
Dubbo	Moree	Wagga
Goulburn	Narrandera	Wollongong
Grafton	Orange	

NEWCASTLE: This city, including its suburbs, has a population of 104,485, a daily hospital average of 327 beds and 36 medical men practising. There are in the district the following hospitals:

	Daily Average.
Newcastle	327
Maitland	141
Waratah	128
Cessnock	123
Kurri	75

In addition, it is an important industrial centre with industries involving considerable health hazards, and it has a well-populated and important and extensive surrounding district.

It may well have assigned to it three C class centres, at Maitland, Cessnock and Kurri, and a full district centre at Newcastle.

In addition, there should be:

One junior physician	£1,250
One junior surgeon	£1,250
One junior obstetrician	£1,250
One senior radiologist	£1,650
One senior pathologist	£1,650
Four additional health visitors	£1,000
Two industrial medical officers	£2,500
	£10,550

An additional £2,500 might be allowed for maintenance expenditure. Summarizing this expenditure for Newcastle:

	No.	Capital.	Maintenance.	Salaries.	No. of Doctors.
		£	£	£	
C class centre	3	25,500	3,750	13,050	12
District centres	1	16,000	5,300	33,450	16
Additional staff	—	—	2,500	10,550	6
Totals	—	41,500	11,550	57,050	34

This allocation[1] would give Newcastle one doctor to every 3,073 of population. This allocation may need revision, but apparently it is sufficient, as only 36 medical men are practising at present.

[1] Exclusive of health officers and administrative staff.

BROKEN HILL, with a population of 26,925 and a daily hospital average of 171, has eight doctors practising in the town. It has, however, an industrial risk, but it has not a real rural population. It should, therefore, be well served with one C class centre and a central district centre with the following staff:

One senior general practitioner	£1,350
Three junior general practitioners	£2,400
Four nurses	£800
One junior surgeon	£1,250
One senior radiologist	£1,650
One junior radiologist	£1,250
One junior pathologist	£1,250
One junior pædiatrician	£1,250
One health officer	£1,250
One industrial medical officer	£1,250
Four health visitors	£1,000
Clerical services	£1,500
	£16,200

The capital cost and the maintenance of this centre would be as elsewhere.

The cost at Broken Hill would be therefore:

	Capital.	Maintenance.	Salaries.
	£	£	£
One C class centre	8,500	1,250	4,350
District centre	16,000	5,300	16,200
Totals	£24,500	£6,550	£20,550

This allocation would give Broken Hill ten clinicians, excluding radiologists, pathologist and health officers. This would be in the proportion of 1 to every 2,700 of population.

The totals for New South Wales in respect of D class centres with their auxiliary C class centres in this group will be:

	No. of Centres.	Capital.	Maintenance.	Salaries.
		£	£	£
C class	6	51,000	7,500	26,100
D class	14	224,000	74,200	468,300
Newcastle	—	41,500	11,550	57,050
Broken Hill	—	24,500	6,550	20,550
Total for N.S.W.	—	£341,000	£99,800	£572,000

Victoria.

In Victoria the following towns would have D class centres:

Colac	Maryborough	St. Arnaud
Echuca	Mildura	Wangaratta
Hamilton	Mooroopna	Warragul
Horsham	Sale	Warrnambool

BALLARAT and GEELONG would both also require two C class centres in addition to the district centres.

Ballarat has a population of 37,411 with 30 practising doctors and a daily hospital average of 172.

Geelong has a population of 39,223 with 31 practising doctors and a daily hospital average of 145.

This allocation would give Ballarat one clinical doctor to every 1,700 persons, and Geelong one to every 1,780 persons. That is, for Ballarat and Geelong the total cost would be:

	No. of Centres.	Capital.	Maintenance.	Salaries.
		£	£	£
Class C	4	34,000	5,000	17,400
Class D	2	32,000	10,600	66,900
Totals	6	£66,000	£15,600	£84,300

BENDIGO, with a population of 29,131, has a daily average at the hospital of 227 beds, with 27 doctors practising. It would be a district centre with the normal local C class centre staff and the district specialist services. In addition, the town and suburbs would require two further C class centres. The cost would therefore be:

	Capital.	Maintenance.	Salaries.	No. of Doctors.[1]
	£	£	£	
Two C class centres	17,000	2,500	8,700	6
One district centre	16,000	5,300	33,450	16
Totals	£33,000	£7,800	£42,150	22

This allocation would give Bendigo one clinical doctor to every 1,324 persons.

The total cost of D class centres, with their auxiliary C class centres, in Victoria would be:

	No. of Centres.	Capital.	Maintenance.	Salaries.
		£	£	£
D class centres	12	192,000	63,600	401,400
Ballarat and Geelong	—	66,000	15,600	84,300
Bendigo	—	33,000	7,800	42,150
Totals for Vic.	—	£291,000	£87,000	£527,850

Queensland.

In Queensland—

ATHERTON and INNISFAIL are near to Cairns.

CHARTERS TOWERS is near to Townsville.

MT. MORGAN is near to Rockhampton.

WARWICK is near to Toowoomba.

BUNDABERG and GYMPIE are near to Maryborough.

All these centres might be classed as C class centres. Gympie and Bundaberg might require more than the standard staff, but Atherton and Mt. Morgan might require less; standard staff will therefore be calculated throughout. This will give a total of seven C class centres.

In Queensland the district centres will be:

Toowoomba	Rockhampton	Townsville
Ipswich	Mackay	Cairns.
Maryborough		

(a total number of seven).

As, however, a review of local conditions might require some modification of this allocation, it is proposed to estimate on eight centres each of C and D classes.

In addition, four industrial medical officers might well be allotted to the State as a whole for posting at suitable centres. These should carry the salary of a junior specialist (mean £1,250) and it would be reasonable to allow £1,000 *per annum* for the total expenses of the four officers.

The cost of D class centres, including auxiliary C class centres, in Queensland is shown thus:

	No. of Centres.	Capital.	Maintenance.	Salaries.
		£	£	£
C class	8	68,000	10,000	34,800
D class	8	128,000	42,400	267,600
Industrial officers	4	—	1,000	5,000
Total for Qld.	—	£196,000	£53,400	£307,400

South Australia.

In South Australia the natural centres of rural population are Port Pirie, Port Lincoln, Mt. Gambier, Wallaroo and Renmark. Each of these should have a modified D class centre with reduced staff, which might well be as follows:

One junior surgeon	£1,250
One junior physician	£1,250
One junior special senses	£1,250
One junior obstetrician	£1,250
One junior pædiatrician	£1,250
One junior radiologist	£1,250
Two health and school medical officers	£2,500
Four health visitors	£1,000
Total	£11,000
Mileage—	
7 doctors at £200	£1,400
4 health visitors at £100	£400
Total	£1,800

[1] Exclusive to health officers and administrative staff.

In addition there should be:

For each district one administrative officer	£1,350
Clerical and other expenses	£1,000
At Port Pirie an industrial medical officer is needed in addition to health officers	£1,250

And £500 might be allowed for the expenses of this off. work.

The building and equipment will probably not be much less than is required for a D class centre, and costs might well be estimated on the basis of a D class centre for each of the five centres.

The costs can be shown thus:

Capital:		
District centre	£12,000	
Equipment	£4,000	
		£16,000
Maintenance:		
Centre	£1,500	
Mileage—		
Clinical	£1,200	
Health	£1,000	
Health visitors	£800	
Administrative	£100	
Nurses' keep	£200	
Office and records	£500	
		£5,300
Salaries:		
C centre staff (7)	£4,350	
Additional nurse (1)	£200	
District staff, clinical (6)	£7,500	
Health officers (2)	£2,500	
Health visitors (4)	£1,000	
Administrative (1)	£1,350	
Clerical	£1,000	
		£17,900

The total of this expenditure for South Australia on D class centres is shown thus:

	No. of Centres.	Capital.	Maintenance.	Salaries.
		£	£	£
D class	5	80,000	26,500	89,500
Industrial officer	1	—	500	1,350
Totals for S.A.	—	£80,000	£27,000	£90,850

Western Australia.

The extra-metropolitan service in Western Australia could be covered from six centres:

Albany	Narrogin	Geraldton
Bunbury	Northam	Kalgoorlie

Of these, the first five could be well served by centres of the kind described for South Australian country centres. The cost of these would be:

	Capital.	Maintenance.	Salaries.
	£	£	£
Unit cost	16,000	5,300	17,900
Five centres	80,000	26,500	89,500

Kalgoorlie and district require special treatment. This area should be provided with:

One C class centre.
One full D class centre.

It is probable that for this D class centre a smaller administrative staff, and perhaps a smaller clinical staff, would be sufficient, but for purposes of simplicity, and having regard to the large area to be served, the unit standards might be accepted. This would make the cost for Kalgoorlie:

	Capital.	Maintenance.	Salaries.
	£	£	£
C class	8,500	1,250	4,350
D class	16,000	5,300	33,450
Total for Kalgoorlie	£24,500	£6,550	£37,750

Combining the costs for Western Australia thus:

	Capital.	Maintenance.	Salaries.
	£	£	£
Five modified D class centres	80,000	26,500	89,500
Kalgoorlie	24,500	6,550	37,750
Total for W.A.	£104,500	£33,050	£127,250

Tasmania.

In Tasmania—

Devonport is so situated that it should be a district centre. Launceston should be a district centre and, in addition, have one other C class centre.

Queenstown should have a C class centre with additional staff as follows:

One junior surgeon	£1,250
One junior radiologist	£1,250
One junior pædiatrician	£1,250
One health officer	£1,250

The cost of this Tasmanian service would be:

	Capital.	Maintenance.	Salaries.
	£	£	£
Launceston:			
C centre	8,500	1,250	4,350
District centre	16,000	5,300	33,450
Devonport:			
District centre	16,000	5,300	33,450
Queenstown:			
C centre	8,500	1,250	4,350
Additional	—	—	5,000
Total for Tasmania	£49,000	£13,100	£80,600

Canberra.

CANBERRA is in a rather different position from that of other centres. It is at present near enough to Goulburn for that city to act as the district centre. It would, when the population is normal, require two C class centres, one for the northern side and one for the southern. The hospital could serve all the needs of the main consultation centre. Each C class centre, however, would be sufficiently served by one senior and one junior general practitioner. In addition would be required:

One junior surgeon	£1,250
One junior special senses	£1,250
One junior pædiatrician	£1,250
One junior radiologist	£1,250
	£5,000

This is expressed in the following summary:

	Capital.	Maintenance.	Salaries.
	£	£	£
C class centres	17,000	2,500	8,700
Centre staff	—	—	5,000
Totals	£17,000	£2,500	£13,700

Canberra has a population of approximately 9,000, with seven doctors now practising.

The above allocation would give a ratio of one doctor to every 1,290 of population.

British Medical Association News.

SCIENTIFIC.

A MEETING of the New South Wales Branch of the British Medical Association was held on September 25, 1941, at the Robert H. Todd Assembly Hall, British Medical Association House, 135, Macquarie Street, Sydney, DR. W. F. SIMMONS, the President-Elect, in the chair.

The Examination of Recruits.

DR. R. J. TAYLOR read a paper entitled "Examination of Recruits for the Army" (see page 700).

DR. F. H. MCCLEMENTS CALLOW read a paper entitled "Examination of Recruits for the Army" (see page 702).

CAPTAIN H. R. H. BEATTIE said that he had been very interested in the discussion of examination of recruits for enlistment, and as a member of the staff of 113 Australian General Hospital he had noted a few points concerning patients admitted to the hospital after having been accepted for the Army. He had been able to collect a small series of approximately 100 cases. The patients had been seen in the orthopædic department suffering from disabilities of the limbs, divided into disabilities of the knee joints, feet,

upper limbs and also backs. The proportion of cases of disability of the knee joint was interesting, and he proposed to dissect the figures from a point of view of the Australian Imperial Forces and Home Defence Forces and conditions occurring before and after enlistment. There were 52 cases of disability of the knee joint, 29 of the feet, 20 of the upper limbs and 9 of the back. With regard to the knee joint, nine cases among men of the Australian Imperial Force and eight among those of the Home Defence Forces existed before enlistment, and 16 occurred afterwards in the Australian Imperial Force and 19 in the Home Defence Forces. With regard to foot disabilities, there were 20 cases in the Australian Imperial Force and nine in the Home Defence Forces; of these, 18 existed before enlistment and 11 occurred afterwards. With the upper limb disabilities, two in the Australian Imperial Force and none in the Home Defence Forces existed before enlistment, and eight occurred afterwards in the Australian Imperial Force and ten in the Home Defence Forces. Disabilities of the back were almost equal in the Australian Imperial Force and Home Defence Forces, two existing in the Australian Imperial Force and two in the Home Defence Forces before enlistment, and two occurring afterwards in the Australian Imperial Force and three in the Home Defence Forces. Captain Beattie remarked that these figures emphasized the vulnerability of the knee joint. It had occurred to him that not many men had been sufficiently investigated on enlistment with regard to injuries to the knee joint. Recruits from sedentary occupations frequently had little disability in private life following damaged cartilages, but the joint broke down after a period in camp. Of recruits with foot disabilities, there were many with potential disability who should not have been accepted for the Army. Of the disabilities of the upper limb very few had caused trouble before enlistment and very few afterwards. Captain Beattie had spent six months in camp before going to 113 Australian General Hospital and, like anyone else with similar experience, he had been struck by the number of cases in which the knee joint cartilages had been damaged both before and after enlistment, and also by the number of disabilities which had been missed because no full examination had been made with the patient stripped.

LIEUTENANT-COLONEL A. C. THOMAS said that as one who was privileged to have the experience and company of Colonel A. W. Morrow during his service abroad, he wished to carry out the promise he had made to Colonel Morrow to bring before the medical profession the need for the most thorough examination of recruits before they were sent overseas. He and Colonel Morrow had prepared a report on that subject, but unfortunately its preparation had not been quite completed and they had to leave it behind. During his trip home he read a report that had been sent to THE MEDICAL JOURNAL OF AUSTRALIA by the staff of the hospital ship *Manunda*, and he was struck with the similarity of the conclusions stated in that report to those reached by Colonel Morrow and himself. Colonel Thomas had arrived too late to hear Dr. Taylor's early remarks; but he wished to refer to three things that they always considered every time a soldier came before them for examination—they had to do the fair thing by the man, by the Army and by the taxpayer. It was difficult to assess the exact value of these three factors. With regard to fairness to the man, Colonel Thomas said that he thought that when men were being examined at home before being sent abroad, they should be examined very carefully and they should not be sent abroad to incur stresses and strains that they could not endure. With regard to fairness to the Army, Colonel Thomas said that he had been struck by the number of men who had come before the board without having done any training whatever. They had been in and out of hospital for periods of six, eight and nine months, and had done not one day's training in camps in Palestine. The first thing that impressed him was the number of members of the first Australian Imperial Force who came before them to be "boarded". The matter was considered so serious by the General Officer Commanding, Australian Imperial Force, that before he made his attempt in the western desert in December, 1940, he withdrew from the desert the majority of soldiers aged thirty-five years and over, and formed an Australian Headquarters Corps Guard Battalion. He did not consider these men capable of standing up to the stress and strain of the desert. That was the first thing to consider when a recruit came for examination. Any man who was aged thirty-five years or looked more than his stated age, should certainly be given the benefit of the doubt on the side of the examiners and should not be accepted. With regard to the third question, that of fairness to the taxpayer, they considered the soldier from the point of view of his history, and demanded that his D.1 form should come with him. The reading of that form revealed many false statements made by these soldiers. The standard set by the board on which he had been working since his return was high, and not many men were now being accepted who should not. Colonel Thomas remembered seeing one man with an ankylosed knee joint; he had also seen another man with a glass eye whose visual acuity with the other eye was 6/36; it was stated on the D.1 form, however, that his visual acuity was 6/6 with both eyes. Many men came with asthma. They had many men before them who had not had asthma for periods up to fifteen years, many who had not had an attack since childhood; and yet the stress and strain of camp life (much greater than for men on home service) caused many to have further attacks of asthma. Colonel Thomas then referred to men with "doubtful" ulcer or peptic ulcer. He said that at the present time a man with a peptic ulcer was not accepted. Damaged knee joints were also a source of trouble. They came to the conclusion that any man with a history of a displacement of the semilunar cartilage or meniscus was not a fit subject for Class I. Those who had been operated on did not come before them so often; but those who were operated on while on active service abroad did come before them often and gave a great deal of trouble. Nearly all the men had to be sent back home. Colonel Thomas thought that the report written by Colonel Morrow and himself was rather critical and caustic; they had written it for Major-General Burston, and were rather hard on medical examiners at home. However, now he was much better pleased with the way the troops were examined. Colonel Thomas proposed to write to Colonel Morrow and to tell him that they would have to withdraw some of the remarks made in that report. Colonel Thomas again drew attention to the need for most careful medical examination of recruits, and assured those present that the stress and strain of active service were only for those who had practically nothing wrong with them. On all occasions they should take into account the age of the recruit when they saw him.

DR. E. L. NEWMAN said that there was one point about medical examination of recruits on which he was never quite satisfied, and that was the question of elevated blood pressure as a disability. Examiners constantly found recruits, particularly those who came down for examination from the country and arrived early in the morning by train, whose blood pressure was elevated and who had tachycardia. Dr. Newman thought it right that they should have a certain period of rest and after half an hour on a couch they should have their blood pressure estimated. But if these recruits went away for two or three days, or rather for any period longer than one day, and were given some sedative drug such as phenobarbital, Dr. Newman wondered whether the medical examiners would not get a false picture of the recruit's suitability in other directions. If raised blood pressure was a disability, was it wise to give these recruits much rest and sedation before the blood pressure was estimated? If they could not stand the trip down in the train, and if the blood pressure was raised sufficiently to cause anxiety, would not active service make things worse? Dr. Newman thought that the blood pressure should return to normal rapidly, within twenty-four hours. If it did not, then if elevated blood pressure was to be taken into account, he thought the recruit was not fit. Dr. Newman asked Dr. Taylor to give more information on the question, because it was one that often came up for discussion.

DR. C. C. MCKELLAR said he was interested in the time taken to examine recruits; multiple examination was the product of hasty examination. Medical instruction laid down what was to be done in a medical examination, and Dr. McKellar did not see why it was impossible to do what was laid down, although he had been told that it was impossible. He had used an auroscope in examining recruits. Dr. McKellar thought that to take fifteen to twenty minutes to examine a recruit was quicker and cheaper in the long run. What, Dr. McKellar asked, was Class II B? He had found it laid down that men in that class could do any duty, other than with a field formation. Later on he found that men with claw-feet could be passed as fit for Class II B. On one occasion, when he had been more careful than on others, he had felt the shoulders of about fifty healthy men; more than half had grating in the shoulders. Dr. McKellar asked Dr. Callow what to do with those men who were fit for duty while wearing a metatarsal pad and who could not move about without it. There were also the question of men with large corns causing no symptoms and the question of painless callosities. Were such men fit or were they not?

The biggest aid to the finding of unfit men was to send to "P.T." all men in the sheltered occupations of the camp, as Dr. Taylor had said; they had never been through "P.T." or they would have been found out much earlier. One recent group of men Dr. McKellar had examined consisted of only eighty men; these had all been passed as fit. There were a man with cervical spondylitis, a man who could not lift his shoulder beyond 60°, two men with chronic osteomyelitis (one of whom had half range of movement

at both hips and the other a severe fixed equinus), one man with claw-feet, one epileptic, one man with asthma, three with hernia, one with sinusitis and one man who could not read the largest type without glasses or clearly identify faces. With regard to repeated examination to avoid impersonation, Dr. McKellar said that the question of finger prints arose; he thought the taking of finger prints would clear up a number of difficulties. There was one inconsistency in the medical instructions—a man could be passed fit for Class II A if he had lost a limb, but not if a thumb did not function properly. Dr. McKellar asked if it would not be better to have specialists to examine the different systems on a kind of belt system. He said he would hate to give an opinion on heart conditions *et cetera*. With regard to malingering, Dr. McKellar said that it was, in his experience, exceedingly rare, and he was reluctant to believe that there was actually much of it among Australian soldiers.

DR. E. H. M. STEPHEN said that the expression in common use that "this is a young man's war" and that there was no place for old men had been equally true under the conditions that existed in 1918. One of his duties at that time was to visit various depots. At Portland, forty or fifty men whose ages did not officially exceed forty years were reviewed as cases of premature senility each fortnight. The cold weather conditions of France were not tolerated by men used to Australian conditions, and they were boarded out with bronchitis and myalgia. On the other hand, there was one new aspect. Medical boards and examination of recruits of the present day revealed an incredible number of sufferers of all ages from peptic ulcers. It was difficult to believe that there were not innumerable men who carried on with similar conditions undetected, because radiology was not utilized for investigation of gastric symptoms twenty-two years ago. The incessant use of chewing gum appeared to him the only alteration in habits since those days. With regard to foot deformities, some men with flat-feet carried on well; a similar grade to all appearances found themselves unable to do so. He thought examiners of recruits did not deserve as much blame as they received. The men offering in the earliest days were on the whole not up to the standard of those seen later. There were a large proportion of men over twenty-eight, a comparatively large number of unemployed whose unemployment was partly explained by the fact that they were not normally fit. Teeth defective to a tragic degree were much more in evidence amongst the early enlistments than later.

In conclusion, Dr. Stephen said that the papers read had been very plain and clear, and the matter had been put from the point of view of the Army and from that of the recruit.

DR. GEORGE BARRON also thanked Dr. Taylor and Dr. Callow for their papers. Dr. Barron said that during the preceding eighteen months he had had the opportunity for sitting on both boards, for "putting out" and "putting in". He had been interested and entertained. He had sat in company with Dr. Stephen for a year, and that had been an education. A great many of the men who had been put out were those enlisted in May, when there was a rush on. With reference to the examination of recruits with their clothes off, Dr. Barron said that things had been remedied and that the men were now given thorough and careful examination. One of the most interesting things was the question of flat-feet. Dr. Barron had seen a great many men with flat-feet, and he thought that the question was more psychological than orthopædic. When men had been in camp for some time and wanted to get out of the Army, word was passed along that flat-feet would do the trick. A great many of the best athletes had feet as flat as pancakes. Dr. Barron knew some men who were playing footoball and had been turned down from the Army. About 17% out of 17,000 had been called back to see whether it was possible to make them fit for the Army. In the examination of recruits one was bound by the regulations. The question in the early days was whether medical examiners were to save the country money by saving pensions. In conclusion, Dr. Barron once more expressed his appreciation of the papers.

DR. R. A. M. ALLEN said that there were two points to which medical men paid perhaps a little too much attention and which caused a great deal of worry. The first was the question whether the condition from which a man was suffering was due to war service or not. One had to preserve some of the country's money if possible and decide that question afterwards. At present repatriation had nothing to do with the medical profession; the question was political, not medical. It was not the medical man's concern in the final issue whether the man was suffering from a complaint due to war service. Dr. Allen knew earnest men on medical boards who were worried over the question whether flat-feet, "doubtful" ulcer *et cetera* were due to war service. The man in question was possibly passed out. The next step in proceedings was for the ex-soldier to go to the Returned Sailors, Soldiers and Airmen's Imperial League and apply for a pension. His application was refused. He then went further, to the Pensions Tribunal, on which no medical man sat, and its members reached a number of surprising decisions. Dr. Allen had seen one man who had an illness due to war service after twenty years—it was acute appendicitis. Dr. Allen thought that, although the question was perhaps a medico-legal point, a great deal could be done for the community, if not for the poor fellow concerned, if some medical men were appointed as advisers to the Pensions Tribunal. Dr. Allen then referred to his second point, which he described as Dr. Callow's astounding request that recruits should be asked to touch their toes with their knees straight. It was known to medical men that many people could not touch their toes with straight knees, but there was no pathological reason; the cause was shortness of the hamstring muscles. Dr. Allen hastened to assure Dr. Callow that he could touch his toes with his knees straight, so the shoe was not pinching.

DR. W. L. CALOV said that as one who was engaged in the examination of soldiers suspected of having pulmonary disease, he had been interested in Dr. Taylor's suggestion that clinical examination of the thorax was sometimes not carefully carried out by medical officers because of the knowledge that an X-ray examination was to be made. This was deplorable. His colleagues and he had already seen evidence of carelessness. They had seen men who were obviously suffering from a pulmonary disorder, whether or not an X-ray picture revealed it. An X-ray picture did not reveal everything, even if some people thought that it did. The fact that a man was to be examined radiologically should not be a reason for slumming the clinical examination. The examiners should bear in mind that if they did so they would let some men go who were suffering from some intrathoracic disorders that X-ray examination did not reveal.

DR. T. W. LIPSCOMB said that there was one point to which he wished to refer, and that was that those who examined recruits at Victoria Barracks, Sydney, or "boarded" them out, should lay down their appreciation of Colonel Macintosh's work in establishing the pathology department and of the work of its staff. The staff was fully trained and highly efficient. Dr. Lipscomb wished it to be placed on record how valuable that addition to the armamentarium was.

DR. S. C. M. HIATT referred to the examination of Militia men. He instanced the cases of men who had a hernia and a hammer-toe and were classed as temporarily unfit for three months, to have the necessary surgical treatment. Three months later the operation had not been performed, and the excuse was that the patient had not been able to afford the treatment. Dr. Hiatt thought that the Army or the country should provide the means for making these men fit, and that they should not have to have treatment at their own expense. They came for examination time and time again with the same disability. Dr. Hiatt knew of no law that forced such men to have their disabilities cured. Dr. Hiatt then referred to another point. He said that in the original examination of men for the Army, if in the mind of the examiner there was any doubt as to the men's ability to carry out training, then they should not be classified as Class I. Moreover, Class II men were more than could be assimilated by the Army. Examiners should think twice before they classified recruits Class II, as the field complement outnumbered the non-field complement.

DR. T. W. LIPSCOMB asked Dr. Taylor whether the current idea of submitting all recruits to psychological tests by lay psychologists was a good idea or not.

Dr. Taylor said that it was not.

DR. B. C. EGLITZKY referred to the question of alcoholics coming for examination. He thought that it would be a good idea if anyone who was undoubtedly under the influence of alcohol was stopped by one of the officers at the depot and not allowed to go in. The only disadvantage in that course of action was that often when such men were sober they would not enlist.

DR. W. F. SIMMONS, from the chair, said that he had done a considerable amount of "boarding" and he had hoped that Dr. Callow would say something about the army boot. In Dr. Simmons's area the boot was of the old army type and 90% of the men who came up for examination wore shoes. Dr. Simmons thought that the examiner could not obtain a good idea of the man's foot power if he had always worn shoes. He considered that many men had suffered from foot disability caused by the badly fitting army boot. Dr. Simmons thought that the speakers might have had something to say about army boots.

XUM

Dr. Taylor, in reply, thanked those present for the way in which the papers had been received and for the interesting discussion. He said that he certainly agreed with what Lieutenant-Colonel Thomas had said about the question of age; he thought that no man over the age of thirty-five years was fit for overseas service such as that in Greece, Crete and Libya. Many such men were really forty-five years of age, and a large number of the recruits passed through in the early days looked much more than their stated age. He thought that the examiners were swayed by enthusiasm and tended to overlook defects which they should not have overlooked. The examination of any man aged over thirty-five years should be much more stringent than for men of about twenty-one years. With regard to the question of asthmatics, Dr. Taylor said that he agreed with Colonel Thomas's remarks on the subject of asthma or allergy; he thought that such recruits should not be accepted. In reply to Dr. Newman, who had asked about the importance of high blood pressure, Dr. Taylor said that it should be remembered that the men were being examined for a short term and not for a life insurance policy. Quite often men came for examination under the influence of many factors causing a rise in the blood pressure, such as excitement, nervousness, hurrying, lack of sleep and in many cases a round of farewell parties. It took a day or more for the alcohol they had imbibed to work out of their system. Dr. Taylor was greatly surprised at the effect of alcohol on the blood pressure, not only systolic but diastolic. In a number of cases he had seen the pressure drop after a period of rest, the systolic as much as 20 millimetres of mercury and the diastolic 10. Dr. Taylor then referred to the question of malingering. He said that he did not want Dr. McKellar to think that he (Dr. Taylor) believed there were a lot of malingerers in the Army. There were quite a number, and there had been plenty in the last war. With regard to Dr. Stephen's remarks on the ætiology of peptic ulcer, Dr. Taylor said that he could not clear up the problem. There were many men who suffered from peptic ulcer in the last war. As for alcoholics, they were a great nuisance. They caused a certain amount of amusement, but were a very disturbing element. Dr. Taylor thought that if a man came for examination twice when drunk, he should be classified as a chronic alcoholic and rejected.

Dr. Callow, in reply to Dr. McKellar, said that crepitus felt in the shoulders was not always in the shoulder joint. Crepitus actually in the shoulder was very rare; it was found more often in the acromio-clavicular joint. A great deal of the crepitus was under the scapula and was not productive of disability. Dr. Callow thought that men who wore a metatarsal pad should not be put down as Class I. Dr. Callow said that he had intended to raise the question of callosities and corns on the sole of the foot; he thought that it was necessary to make a careful examination to see whether any deformity was causing them. If they were due to a deformity, the man was not fit for service. With regard to the question of touching toes, Dr. Callow said that he had intended to suggest that the man should be put fairly quickly through the range of movement. He had not intended to imply that if the man could not touch his toes on the first attempt he should be rejected. Shortening of the hamstrings was often productive of disability; it caused kyphosis. If the recruit could not do such things as touching his toes, it was suggested that a little more attention should be paid by the examiner to see whether he was disabled or not. With reference to the question of making a man undergo some operation or corrective treatment to make him fit for service, Dr. Callow said that they had "boarded out" a number of men who had refused to undergo treatment, and they had no power to compel them to agree. With regard to the army boot, Dr. Callow said that he had recently been wearing them himself, and he thought that those at present supplied were remarkably good. They were much more comfortable than any other shoes to wear for heavy walking. He thought that the real difficulty was that the men were accustomed to wear soft shoes; the boot was rigid and did not stretch like a soft shoe. A tremendous number of men were wearing boots that did not fit them; one quartermaster had to fit 200 pairs in an evening. The men sat on the floor and pulled on a pair of boots, and if the boots went on they kept them. The problem was rather an unwise fit than a defect in the boots themselves. Dr. Stephen had criticized the speakers for criticizing the examination; but Dr. Callow thought they should as nearly as possible achieve perfection. They had to make their work match the work done by the men on active service abroad.

Dr. Simmons, from the chair, thanked Dr. Taylor and Dr. Callow for their instructive and interesting contributions to such an important subject.

Nominations and Elections.

THE undermentioned has applied for election as a member of the Victorian Branch of the British Medical Association:

Smithwick, Gerald William, L.R.C.P. and S. (Edinburgh), Davey Street, Frankston.

Books Received.

"Recent Advances in Medicine, Clinical, Laboratory, Therapeutic", by G. E. Beaumont, M.A., D.M., F.R.C.P., D.P.H., and E. C. Dodds, M.V.O., D.Sc., Ph.D., M.D., F.R.C.P., F.I.C., F.R.S.E.; Tenth Edition; 1941. London: J. and A. Churchill Limited. Demy 8vo, pp. 454, with 45 illustrations. Price: 18s. net.

Diary for the Month.

JAN. 6.—New South Wales Branch, B.M.A.: Council (Quarterly).
JAN. 7.—Western Australian Branch, B.M.A.: Council.
JAN. 13.—Tasmanian Branch, B.M.A.: Branch.
JAN. 30.—Tasmanian Branch, B.M.A.: Council.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

New South Wales Branch (Honorary Secretary, 135, Macquarie Street, Sydney): Australian Natives' Association; Ashfield and District United Friendly Societies' Dispensary; Balmain United Friendly Societies' Dispensary; Leichhardt and Petersham United Friendly Societies' Dispensary; Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney; North Sydney Friendly Societies' Dispensary Limited; People's Prudential Assurance Company Limited; Phœnix Mutual Provident Society.

Victorian Branch (Honorary Secretary, Medical Society Hall, East Melbourne): Associated Medical Services Limited; all Institutes or Medical Dispensaries; Australian Prudential Association, Proprietary, Limited; Federated Mutual Medical Benefit Society; Mutual National Provident Club; National Provident Association; Hospital or other appointments outside Victoria.

Queensland Branch (Honorary Secretary, B.M.A. House, 225, Wickham Terrace, Brisbane, B.17): Brisbane Associated Friendly Societies' Medical Institute; Bundaberg Medical Institute. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL or position outside Australia are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.

South Australian Branch (Honorary Secretary, 178, North Terrace, Adelaide): All Lodge appointments in South Australia; all Contract Practice appointments in South Australia.

Western Australian Branch (Honorary Secretary, 205, Saint George's Terrace, Perth): Wiluna Hospital; all Contract Practice appointments in Western Australia.

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